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SELECTED TRANSLATIONS OF
ABSTRACTS IN REFERATIVNYY ZHURNAL - FIZIKA, No. 3, 1960

This report consists of complete translations of the Russian-language abstracts of articles, which were originally published in the Sino-Soviet bloc and in Yugoslavia, excluding the USSR.

The Soviet subject classification system used in the original Russian language abstracts has been followed in this publication.

EAST GERMANY/Theoretical Physics - General Problems.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5014

Author : Ch. I. Shal'reiter

Inst : -

Title : The Mass of Energy, Part I.

Orig Pub : Wiss. Z.E.M. Arndt-Univ. Greifswald. Math.-natur-wiss.
Reihe, 1957-1958, 7, No 3-4, 199-202

Abstract : Using nonrelativistic examples (for example, the propagation of waves in gas, thermal energy), the author shows that a certain measure of inertia can be assigned to the flux of mechanical energy L , that is, a mass μ , connected with the velocity of this flux by the formula $L = \mu q^2$ analogous to the relativistic formula $E = mc^2$. -- V.P. Shinelev

Card 1/1

HUNGARY/Theoretical Physics - General Problems.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5015

Author : Ch.I. Shal'reiter

Inst : -

Title : The Mass of Energy, Part II.

Orig Pub : Wiss. Z.E.M. Arndt-Univ. Greifswald. Math.-natur-wiss.
Reihe, 1957-1958, 7, No 3-4, 203-205

Abstract : Considering uniform motion of an electric charge or a magnet in empty space the author reaches the conclusion that both should experience a retarding action on the part of the Maxwellian fields that they produce, and that therefore Newton's first law (the law of inertia) is violated in these cases. All the considerations stay within the framework of classical electrodynamics. N.P. Shmelev

Card 1/1

HUNGARY/Theoretical Physics - Relativity. Unified Field Theory.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5023

Author : Karolyhazy Frigyes

Inst : -

Title : Space and the Clock.

Orig Pub : Fiz. szemle, 1959, 9, No 3, 80-84

Abstract : Scientific popular article.

Card 1/1

POLAND/Theoretical Physics - Relativity. Unified Field Theory.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5027

Author : Jankiewicz, C.

Inst : The University, Wroclaw: Mathematics Institute, Polish Academy of Science.

Title : Equations of Motion in the Linear Field Theory.

Orig Pub : Bull. Acad. polon. sci. Ser. sci. math., astron. et phys., 1959, 7, No 3, 175-178, XIII

Abstract : For point sources of an electromagnetic field, the author indicates an action integral whose stationary behavior, when varied over the functions that describe the provision of the sources, leads to the equation of motion. Of particular significance in this case is a special choice of the metric tensor. Specifically, if $\eta_{\alpha\beta}$ is the metric

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POLAND/Theoretical Physics - Relativity. Unified Field Theory.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5027

tensor of the Minkowski space and ψ^α are linear functions of the coordinates, then the unknown metric is given in the form

$$g_{\mu\nu} = \eta_{\alpha\beta} \frac{\partial \psi^\alpha}{\partial x^\mu} \frac{\partial \psi^\beta}{\partial x^\nu}$$

Ya.I. Pugachev

Card 2/2

RUMANIA/Theoretical Physics - Relativity. Unified Field Theory.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5030

Author : Gabos Zoltan

Inst : -

Title : On Gravitational Potentials, I.

Orig Pub : Studii si. cercetari stiint. Acad. RPR Fil. Iasi, Fiz. si stiinte tehn., 1958, 9, No 1, 63-69

Abstract : Using the Schwarzschild metric, the author shows that a weak gravitational field can be described by a potential in the form of a 4-vector $\{A_\alpha, \varphi_{gr}\}$

where $A_\alpha = (\lambda m_0/r) x_\alpha + \dots$, $\varphi_{gr} = -(\lambda m_0 c^2/r) (1 + \lambda/2r - v^2/2c^2 - r^2 c^2) \lambda$

is the parameter of the Schwarzschild metric. --

A.A. Borgardt

Card 1/1

RUMANIA/Theoretical Physics - Relativity. Unified Field Theory.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5031

Author : Gabos Zoltan

Inst : -

Title : On Gravitational Potentials, II.

Orig Pub : Studii si cercetari stiint. Acad. RPR Fil. Iasi. Fiz.
si stiinte tehn., 1958, 9, No 2, 189-195

Abstract : The author investigates different metrics, used to describe a weak gravitational field, and shows that it is possible to obtain from them the same expression for the 4-vector of gravitational potential, which he obtained from the first part of the investigation (abstract 5030). -- A.A. Borgardt

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EAST GERMANY/Theoretical Physics - Classical Electrodynamics.
Classical Theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5042

Author : Knapcz Zeza

Inst : -

Title : Remarks on Weak Affine Laws of Conservation of Multimoments within the Framework of the General-Relativistic Covariant Lagrangian Formulism.

Orig Pub : Ann. Phys. (DDR), 1959, 3, No 5-6, 310-344

Abstract : Multimoments are called certain product of coordinates by "energy-like" quantities (energy, momentum, etc.). Making use of the invariance of the Lagrangian under arbitrary coordinate transformations, the author obtains the laws of conservation of multimoments in the usual manner. -- Ya.I. Pugechev

Card 1/1

EAST GERMANY/Theoretical Physics - Classical Electrodynamics,
Classical Theory of Fields

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5043

Author : Bopp Fritz

Inst : The University, Munich, West Germany

Title : Remarks on the Conformal Invariance of Electrodynamics and
the Principal Equations of Dynamics.

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 96-102

Abstract : It is shown that the 15-parameter group of conformal transformations, which includes the 10-parameter inhomogeneous Lorentz group, the one parameter subgroup of extensions, and the 4-parameter subgroup of transformations
$$X'^{\mu} = (X^{\mu} - x_{\nu} X^{\nu} a^{\mu}) / (1 - 2a_{\nu} x^{\nu} + a_{\nu} a^{\nu} x^{\rho} x^{\rho}),$$

can be obtained from the condition that in the transition to the transform coordinates the components $\sqrt{-g} g^{\mu\nu} p_{\mu} p_{\nu}$
 $(\mu, \nu, \rho, \sigma = 0, 1, 2, 3)$

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EAST GERMANY/Theoretical Physics - Classical Electrodynamics.
Classical Theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5043

do not change compared with the case when $g_{\mu\nu}$ is a metric tensor for the Minkowski 4-space. The physical meaning of the condition is seen by the author to lie in the fact that if the general-relativity invariant Maxwell equations contain an antisymmetric tensor density $H^{\mu\nu}$, and the general invariant equations of motions contain an antisymmetrical tensor $\mathcal{B}_{\rho\sigma}$ expressed in terms of the 4-potential, then there should be separated such a subgroup of general transformations of 4-coordinates, that the relation between $H^{\mu\nu}$ and $\mathcal{B}_{\rho\sigma}$ are the same as in the Minkowski space. It is shown that relativistic equations of motion for a classical particle can be written in conformal-invariant form, provided the rest mass of the particle is transformed in conformal transformation as a

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Classical Theory of Fields.

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5043

quantity reciprocal to the length (that is, if the mass
has a conformal weight of -1). -- G.A. Zaytsev

Card 3/3

EAST GERMANY/Theoretical Physics - Quantum Electrodynamics.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5062

Author : Henneberger Walter C.

Inst : The University, Gottingen West Germany

Title : Exact Solutions for the Dipole Radiation of a Harmonic
Oscillator

Orig Pub : Z. Phys., 1959, 155, No 3, 296-213

Abstract : A harmonic oscillator radiating an electromagnetic field
is investigated in the dipole approximation. Perturbation
theory is not used in the calculations. The author uses
Van Kampen's results of the canonical transformation (Van
Kampon, N.G. Kgl. danske vid selskab Mat. fys. medd., No
15, 1951, 26, which were improved by Steinwedel (RZhFiz,
1956 No 7, 18871). The electromagnetic field appears not
as a perturbation, but as a result of a further change in

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EAST GERMANY/Theoretical Physics - Quantum Electrodynamics.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5062

the system with specified initial conditions. The frequency distribution of this field is determined asymptotically (as $t \rightarrow \infty$) by a superposition of wave functions of the initial state. The natural line width of the spectrum is found, and is independent of the number of the excited state. Simultaneous emission of more than one photon is forbidden. The previously-known results concerning the conservation of the form of the wave packet are confirmed. The formula showing the decrease with time of the mean square the coordinates of the quantum oscillator coincides with the classical solution obtained there. -- V.P. Shmelev

Card 2/2

HUNGARY/Theoretical Physics - Quantum Theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5068

Author : Marx Gyorgy

Inst : -

Title : Fundamental Theorem of Continuous Transformations in Quantum Theory

Orig Pub : Magyar tud. akad. kozp fiz. kutato int. kozl., 1958, 6, No 5, 397-407; VII

Abstract : Starting out with the field equations and the commutation relations, the author constructs a unitary operator, which is the generating function of symmetry transformations in Hilbert space. The sequency of the author's arguments is the opposite of that used by Schwinger in the covariant formulation of quantum theory: this eliminates certain inconsistencies in the preceeding analysis.

Card 1/1

POLAND/Theoretical Physics - Quantum theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5069

Author : Bialynicki - Birula I.

Inst : -

Title : On the Internal Degrees of Freedom of Particles in Quantum Theory

Orig Pub : Acta phys. polon., 1958, 17, No 2-3, 158-176

Abstract : Definitions are given for the polarization and magnetic moment operators in quantum field theory, and equations are also obtained for the variation of these operators with time in the case of interacting fields. See also RZhFiz 1958, No 11, 24462-24464.

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BULGARIA/Theoretical Physics - Quantum Theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5070

Author : Mitskevich, N.V.

Inst : Uzbek University, Samarkand

Title : Interaction Between Fields and Quantum Relations

Orig Pub : Dokl. Bolg. AN, 1958, 11, No 5, 367-370

Abstract : It is shown in which manner the energy-momentum tensor and the generalized moment, introduced in an earlier paper (RZhFiz, 1959, No 3, 4829) can be defined uniquely in quantum theory. The method does not presuppose the absence of interaction or a weakened action between the fields, and is therefore applicable in principle for a nonlinear gravitational field, too. -- P.G. Kard

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RUMANIA/Theoretical Physics - Quantum Theory of Fields.

B-

Asb Jour : Ref Zhur Fizika, No 3, 1960, 5088

Author : Vescan Teofil T.

Inst : -

Title : Consideration of the Theory of Elementary Particles. C. Theory of Fusion of Elementary Particles and Heisenberg's Research on the Unified Theory of Elementary Particles.

Orig Pub : Studii si cercetari Stiint. Acad. RPR Fil. Iasi. Fiz. si stiinte tehn., 1958, 9, No 2, 205-214

Abstract : The author develops the de Broglie theory of fusion (de Broglie L., Theorie generale des particules a spin. Paris, 1943), recalling in this connection the Heisenberg nonlinear theory, the author emphasized that the two theories are related. For parts A and B, see RZhFiz 1959, No 919614.

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POLAND/Theoretical Physics - Quantum Theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5089

Author : Minardi, E.

Inst : -

Title : On the Bilocal Theory of the Electron

Orig Pub : Acta phys. polon., 1958, 17, No 6, 429-433

Abstract : The interaction between an electron and external electromagnetic field is described by an 8-dimensional spinor equation. The wave function depends symmetrically on the ordinary "external" coordinates χ_ν and on the "internal coordinates" γ_ν ($\nu=1, 2, 3, 4$). The electromagnetic mass of the electrons breaks up accordingly into "external" and "internal" part. In calculating "internal" part with the aid of perturbation theory, in the initial approximation the electron is considered as a Majorana neutrino. The total electromagnetic mass of the electron is found to be equal to the experimental one, if the universal length

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POLAND/Theoretical Physics - Quantum Theory of Fields.

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5089

has a value $\ell = 2.3 \times 10^{-13}$ cm. At the same value of ℓ it becomes possible to obtain mass values close to experimental for other elementary particles, too. -- V.S. Barashenkov

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HUNGARY/Theoretical Physics - Quantum Theory of Fields.

B-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5098

Author : Gyorgyi Zeza

Inst : -

Title : Bound States in Paired Meson Theory (the NK Model of the Hyperon)

Orig Pub : Magyar tud. akad. kozp. fiz. kutato int. kozl., 1958, 6, No 5, 373-379, V

Abstract : An investigation is made of the bound states in paired meson theory for the case of vector interaction. Such an approach can be considered as a field on theoretical model of the hyperon (NK model).

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RUMANIA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5114
Author : Toth Teodor
Inst : -
Title : New Principles of Acceleration of Charged Particles.
Orig Pub : Automat. si electron., 1959, 3, No 2, 80-84
Abstract : The author describes "coherent" methods of accelerating particles to large energies, including acceleration by means of moving media, shock waves, and electromagnetic waves.

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YUGOSLAVIA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5116
Author : Cilenseh Edvard
Inst : Institute Josev Stefan, Ljubljana, Yugoslavia
Title : Electrostatic Accelerator of the Institute "Jozef Stefan" In Ljubljana.
Orig Pub : Elektrotekn. vesn., 1958, 12, No 5-6, 187-192
Abstract : After a short survey of existing accelerators and a detailed exposition of the principle of operation and technical improvement in belt-type electrostatic generators (ESG), the author describes a two-Mev electrostatic accelerator, constructed under the leadership of the author in 1953 -- 1957 in the Institute "Jozef Stefan" in Ljubljana (Yugoslavia). The accelerator operates in compressed nitrogen at a

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5116

pressure of 10 atm. The diameter of the high voltage electron of the ESG is 1.1 meter, the height of the insulating columns is 1.6 meters. The tank of the accelerator has a diameter of 1.8 mm and a height of 4 meters. The injector employed is a high frequency iron source. The accelerating tube is glued together from porcelain rings, between which are inserted aluminum electrodes. The high tension is uniformly distributed between these electrodes. A cotton belt 55 cm wide is set into motion by two electric motors 3.3 kw each, located on both sides of the lower driving shaft. The rate of motion of the belt is 19 meters per second. The voltage on the discharge brush is varied from 10 to 40 kv, depending on the pressure of the nitrogen in the tank. The accelerated beam can be focused on the target for any accelerated voltage from 200 kv to 2.3 Mv.

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CHINA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5117

Author : -
Inst : -
Title : Van de Graaff Generator for the Acceleration of Electrons to 2 Mev.

Orig Pub : Uli tumbao, Huli tongbao. 1959, No 3, 109-111

Abstract : No abstract.

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YUGOSLAVIA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizik , No 3, 1960, 5142

Author : Slivnih, J., Zemljii, A.

Inst : -

Title : Preparation of Uranium Samples for Mass Spectrometric Analysis

Orig Pub : Repts. 11 J. Stefan 77 Inst., 1958, 5, 49-51

Abstract : The authors describe a setup for the preparation of samples of UF_6 , intended for mass spectrometric isotopic analysis. The setup consists of the following basic parts: generator of elementary fluorine, reaction tube, and traps. The generator represents an electrolytic cell with electrolyte $KF \cdot 2HF$; the F_2 is directed to the reaction tube, heated to $540^\circ C$. At this temperature the fluoridation reaction terminates after ten minutes. The UF_6 produced condenses in the trap, which is cooled with dry ice. To prepare

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Abs Jour : Ref Zhur Biol., No 3, 1960, 5142

80 mg of UF_6 approximately one hour is necessary. The changeover of uranium to UF_6 amounts to approximately 92%. Ye. L. Frankevich

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YUGOSLAVIA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5143

Author : Debenec L. Kramer, V., Marsel, J., Vrscaj, V.

Inst : -

Title : Mass Spectrometric Measurements of UF₆

Orig Pub : Repts. LL J. Stefan 77 Inst., 1958, 5, 33-39

Abstract : A Nier-type 60° mass spectrometer with a resolution of 350 was used to measure the isotopic ratio U²³⁸/U²³⁵ when UF₆ is introduced into the instrument. The UF₆ can be introduced in a viscous stream through two capillaries, from vessels located in a thermostatic bath. One vessel contains UF₆ with natural contents of isotopes. The measurement of the isotopic ratio was carried out by comparing the intensity of the mass lines 330 and 383 in multiple magnetic or electric scanning. For exact measurements of small differences in the isotopic ratios of two specimens,

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5143

use was made of the method of successive inlet of the samples. The "memory" effect of the instrument to old, previously admitted samples, was investigated. It is shown that in the case of a small difference in the isotopic ratios of the specimen, it is enough to stop the apparatus for two minutes for evacuation between measurements. It is established that the isotopic ratio U²³⁸/U²³⁵ in natural uranium is 138.2 ± 0.4 . Ye.L. Frankevich

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Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5147

Author : Mitrani L., Betev B.

Inst : -

Title : Trigger Feeding of a Couple of Geiger-Muller Counters

Orig Pub : Kokl. Bolg. AN, 1958, 11, No 5, 363-366

Abstract : A method is proposed for connecting two Geiger-Muller counters in such a way as to reduce considerably the depth time of the system. The filaments of both G-M counters are connected to anodes of the tubes of the multivibrator with two stable states. On the cathodes of the counters is applied a negative potential. The parameters of the circuits are chosen to satisfy the condition that the voltage on the counter, connected to the anode of the cut-off tube of the multivibrator, lies within the Geiger region, whereas the voltage on the counter connected to the anode

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5147

of the conducting tube of the multivibrator is lower than the Geiger region. The pulse in the first counter causes operation of the multivibrator, which simultaneously reduces the voltage on the first counter, below the Geiger region (quenching of the discharge), and establishes the working voltage on the second counter. Thus the use of such a circuit is practically equivalent to pulsed-feeding of Geiger-Muller counters, and the frequency of the pulse-feeding is varied automatically with intensity of the measured radiation. The number of registered pulses is independent of the duty-cycle coefficient. An additional advantage of such a system is that it serves simultaneously as a scaler circuit. Working parameters of a circuit are given, intended for use with STS-5 counters.

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CZECHOSLOVAKIA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5149
Author : Hebek Antonin
Inst : -
Title : Effect of Liquid Vapor on Pointed Geiger-Muller Counters
Orig Pub : Chekhosl. fiz. zh., 1959, 9, No 1, 127-128
Abstract : No abstract.

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HUNGARY/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5152
Author : Mathe Gyorgy
Inst : -
Title : Broad-band Scintillation Gamma Spectrometer for Relative Measurements
Orig Pub : Magyar fiz. falyoirat, 1959, 7, No 2, 129-137
Abstract : No abstract.

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CZECHOSLOVAKIA/Nuclear Physics - Installations and Instruments.
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C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5155

Author : Silar Josef, Smola Jaroslav

Inst : -

Title : Scintillation Probe with Large Surface for the Registration of Particles

Orig Pub : Jaderna energie, 1959, 5, No 4, 124-128

Abstract : Measurements were made of the parameter of a long light pipe made of organic glass. The pulse distribution at the output of the scintillation probe was measured. Using a 6LRK41 photomultiplier, the authors have determined the basic parameters of the counter, namely the plateau, the characteristics, and the background.

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EAST GERMANY/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5187

Author : Thielemann, F.

Inst : Institute of Applied Radioactivity, Leipzig, East Germany

Title : Method of Preparation of Radioactive Isotope. I.

Orig Pub : Kernenergie, 1959, 2, No 4, 320-324

Abstract : A detailed description is given of a procedure for preparing radioactive isotopes, in the form of a uniform dispersed mixture of radioactive isotopes and plastic. In the preparation of the sources, the radioactive substance can be used both in solid form and in solutions. The thickness of the sources ranges from 0.1 microns to several millimeters. The contents of the radioactive substance in the plastic can reach 80% by weight. The plastics used can be

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5187

polyvinyl, plexiglas, polyamides, and many others.

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Methods of Measurement and Research

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5195

Author : Klumpar Josef, Majerova Miroslava, Jirouseh Panel

Inst : Dosimetricke oddeleni UJV-CSAV, Prague, Czechoslovakia

Title : Dosimetry of Radioactive Isotopes Using a 4π -Counter and
Comparison of the Results Obtained with Measurements made
with a G-M Counter

Orig Pub : Jaderna energie, 1959, 5, No 6, 190-193

Abstract : The authors describe the construction and give the basic
parameters of a flow-through 4π -counter, intended for the
measurement of radioactive isotopes. The counter consists
of two chambers, with individual anodes. Both chambers
are separated by a thin liner, on which is deposited the
measured radioactive compound. The anodes of the counter

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5195

are made of tungsten wire 0.05 mm in diameter. A brief description is given of the influence of the liner on the results of the measurements of the activity of the compounds with different β -spectrum energy. The results of the measurements are compared with the data obtained with the aid of a GM counter with thin window. An analysis of the measurement errors is made.

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HUNGARY/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5202

Author : Tihanyi Laszlo

Inst : -

Title : Calculation of Shielding Against γ -Radiation

Orig Pub : Energie es atomtechn., 1959, 12, No 1, 7-12

Abstract : Curves have been worked out for a rapid determination of the dimensions of the protective shield.

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CZECHOSLOVAKIA/Nuclear Physics - Installations and Instruments.
Methods of Research and Measurement.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5206 .
Author : Heber Milos
Inst : -
Title : Radiochemical Laboratories for Work with High Activities
Orig Pub : Jaderna energie, 1959, 5, No 6, 184-189
Abstract : A survey is given of materials on the equipment of radio-chemical laboratories, as presented at the Second International Conference on Peaceful Use of Atomic Energy.

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CHINA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5208
Author : Ho Zah-wei, Lou Tsu-yenz, Sun Hantcheng
Inst : Institute of Atomic Energy Research, Academy : Sinica
China
Title : On the Preparation of Nuclear Emulsions N-2 and N-3
Orig Pub : Uli synebao, Acta phys. sinica, 1959, 15, No 3, 131-138
Abstract : The work concerns certain questions connected with the process of preparation of nuclear emulsions, which are sensitive to ionization produced by protons. The regulation of the concentration of the bromine ions during the time of preparation of the emulsion has made it possible to obtain silver-bromine grains which are homogeneous in size. To increase the sensitivity, the optimal conditions

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of preparation have been chosen, and the sensitizer - triethanolamine - is introduced directly before pouring. The regression of the latent image is adding to the finished emulsion gold salts. To improve the transparency of the emulsion, purified gelatin is used. At the present time it is possible to obtain nuclear emulsions with uniform properties, sensitive to ionization produced by protons. In their characteristics, these emulsions are similar to "Ilford C-2" used in nuclear research.

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CHINA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5209

Author : Lou Isu-yeng, Sun Han-tcheng, Leu Hei-tchang, Ho Zah-wei

Inst : Institute of Atomic Energy Research, Academy Sinica, China

Title : Methods of Preparation and Characteristics of Nuclear Emulsions.

Orig Pub : Uli synebao, Acta phys. sinica, 1959, 15, No 3, 139-144

Abstract : Data are reported on certain nuclear emulsions, which can be prepared by simple laboratory methods. The characteristics of these emulsions are compared with the characteristics of the Ilford nuclear emulsions. The properties of proton-sensitive emulsions N-2 and N-3 are approximately the same as the properties of Ilford C-2. The N-2 nuclear emulsions, which contain bromine or lithium and which are

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5209

intended for the registration of thermal neutrons, apparently have better properties than the Ilford C-2 emulsions containing bromine or lithium. The sensitivity of the electron-sensitive emulsion N-4 is of the same order as that of the emulsion "NIKFI R" and Ilford G-5. The properties of supersensitive electron-sensitive emulsion N-5 are discussed.

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CHINA/Nuclear Physics - Installations and Instruments.
Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5214

Author : Khe Pin

Inst : -

Title : Methods of Enriching U²³⁵

Orig Pub : Kesyne tunbao, Nauchn. vestn., Scientia, 1959, No 2, 36-41

Abstract : No abstract.

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Methods of Measurement and Research.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5217

Author : Beslui E., Pestrascu M.G.

Inst : -

Title : Determination of the Nuclear Charge from the Number of δ Electrons

Orig Pub : Studii si cercetari fiz., 1959, 10, No 1, 37-45

Abstract : A procedure is described for determining the charge of light nuclei by the number of δ electrons, formed by them upon passage through nuclear emulsion. The calculation formulas are given.

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EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5227

Author : Kessler Jsachim

Inst : Physics Institute, Technical College, Karlsruhe, West Germany

Title : Single Scattering of Electrons of Medium Energies by Nuclei of Heavy Elements.

Orig Pub : Z. Phys., 1959, 155, No 3, 350-367

Abstract : The Mott theory of Coulomb scattering of electrons and certain experimental results are in contradiction. In the present paper to investigate this problem a new experimental method is used: electrons with 150 kev energy are scattered not by 4 , but in a low-pressure gas. To accumulate sufficient statistical material, instead of the small thickness of the target, a ring counter was used, in

Card 1/2

EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5227

which all the results were integrated over the azimuth angle. The scattering in the gas target has that substantial advantage, that corrections for multiple scattering are negligibly small. The basic experimental difficulty consists of the need for total exclusion of the electrons that are scattered backward from the chamber walls. The relative magnitude of the cross sections was determined at angles of 60, 90, 120 and 135° for elements with atomic numbers 36, 54, and 80. The results of the experiments, within the limits of experimental accuracy ($\pm 5\%$), agree with Mott's theory.

Card 2/2

EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5252

Author : Derado, I., Lutjens, G., Schmitz, N.

Inst : Max Planck Institute of Physics and Astrophysics, Munich, West Germany

Title : On the Interpretation of Photographs Obtained with the Aid of a Bubble Chamber, and Results of Experiments on the Scattering of Pions by Protons.

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 103-120

Abstract : A numerical method of analysis of elastic and inelastic scatterings of pions with momenta 1.14 Bev/c by protons in a bubble chamber is described. To exclude the phenomena which are characterized by short tracks, for which the analysis is difficult or impossible, two criteria were used. For each measured phenomenon one calculates the

Card 1/3

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5252

correction factor in order that no systematic error be introduced as a result of the indicated selection. With the aid of an electronic computer, the geometric and kinematical characteristics of the phenomena were calculated from the coordinates of several bubbles on each track and from the deflection of the tracks of the secondary particles in a magnetic field. For the great part it was possible to establish whether the scattering is elastic or inelastic, and when it was found inelastic with production of a single pion, it was possible to establish whether the produced pion is positively charged or neutral. In those cases when in an inelastic scattering it was impossible to establish from kinematic considerations the polarity of the pion, the density of the δ particles was used for this purpose. On the basis of the measurement results, the total cross sections of different negative-pion -- proton scatterings were calculated. The momentum

Card 2/3

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5252

distributions of secondary particles of both reactions
 $\pi^- + p \rightarrow \pi^- + p + \pi^0$ and $\pi^- + p \rightarrow \pi^- + p \rightarrow \pi^- + n + \pi^+$
were calculated in the center-of-mass system.

Card 3/3

POLAND/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5277

Author : Zielinski Przemyslaw

Inst : -

Title : Hyperfragments -- Review of Certain Theoretical Problems

Orig Pub : Pastepy fiz., 1959, 10, No 3, 341-361

Abstract : Survey article. Bibliography, more than 130 titles.

Card 1/1

EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5283

Author : Stech Berthald, Kramer Gustav

Inst : The University, Heidelberg, West Germany

Title : γ_5 -Invariance and Strong Interactions

Orig Pub : Z. Phys., 1959, 154, No 1, 128-132

Abstract : In a preceding paper (Abstract 5282 -- Physical Review Letters, 1959, Vol. 2, No 2, 63-64) there were obtained certain corollaries of a generalized γ_5 -invariance for strong interactions, proposed by one of the authors. In the present paper a detailed deduction and discussion of these corollaries is given. For interactions between pions and baryons, two possible types of couplings are obtained. 1. The coupling is determined by the total current vector in isotopic space, and does not contain a

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EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5283

direct $\Lambda \leq \pi$ coupling; strong parity conservation is insured here even in the presence of an electromagnetic and isotopically-invariant K-meson interaction. 2. There exists a direct pion-barium interaction in the presence of global symmetry, i.e., a $\Lambda \leq \pi$ coupling. In this case the pion-interactions retain their parity strictly, provided only one can neglect the asymmetrical K-meson couplings. The k-meson couplings in themselves can violate the invariance under spatial reflections.

Card 2/2

EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5284

Author : Kramer, G., Pollnik, H., Stech, B.

Inst : The University, Heidelberg, West Germany

Title : γ_5 -Invariance and Parity Conservation in Strong Interactions.

Orig Pub : Z. Phys., 1959, 154, No 5, 564-568

Abstract : The authors investigate the question of whether strong interactions can be written in a form that is invariant under the transformation $\psi \rightarrow \gamma_5 \psi$ so as not to violate parity conservation. The interaction between pions and nucleons is considered, and is taken in the form

$$L_{\pi N} = (f/m) \bar{\psi} \gamma_{\mu} (1 + \gamma_5) \psi \cdot \partial \phi / \partial x_{\mu} \quad (1)$$

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5284

and the operator of isotopic spin T is chosen such (dependent on Φ) that L_W be invariant under reflection. In the case of neutral theory it is not enough to take $T=1$ for this purpose, since the neutral scalar mesons with vector coupling cannot in general be transformed from the Lagrangian. In symmetrical theory one must put

$$T = \frac{1}{2} (\tau + (f/m) [\Phi \tau]) / [1 + (f/m)^2 \Phi^2]$$

(τ is the ordinary operator of isotopic spin). It is shown that in this form of the operator T , the Lagrangian of the interaction can be transformed, with the aid of the canonical transformation $\psi = U \psi'$, $\Phi = \Phi'$, to a Lagrangian which is nonlinear in Φ , and which retains the parity; Here Φ describes the wave field of the pseudo-scalar mesons. The question of the quantization

Card 2/3

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5284

and commutation rules for the functions ψ' is not discussed. -- B.L. Ioffe

Card 3/3

EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5302

Author : Burmeister, J., Lanius, K., Meier, H.W.

Inst : Nuclear Physics Institute, German Academy of Sciences,
East Germany

Title : On the Interpretation of Nucleon-Nucleon Interactions
at High Energies on the Basis of the Two-Center Model

Orig Pub : Monatsber. Dtseh. Akad. Wiss. Berlin, 1959, 1, No 3,
160-164

Abstract : Further details are considered of the model of two excited
nucleons, investigated by the authors in an earlier paper
(Referat Zhur Fizika 1960, No 1, 588). It is shown that
if the meson spectrum in the decay of an excited center is
described by the Heisenberg theory in the rest system of
the center, then the average meson energy (in the same

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EAST GERMANY/Nuclear Physics - Elementary Particles.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5302

system) depends little on the number of cascade particles.
Finally, the dependence of the number of shower particles
on the number of cascade particles on the coefficient of
inelasticity and on the energy is close in this model to
the corresponding dependence in the Koba theory. -- A.I.
Nikishov

Card 2/2

HUNGARY/Nuclear Physics - Structure and Properties of Nuclei

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5329

Author : Dav"dov, A.S., Filippov, S.F.

Inst : Moscow State University.

Title : Collective Excited States of Even-Even Atomic Nuclei

Orig Pub : Acta phys. Acad. scient. hung., 1958, 9, No 1-2, 169-176

Abstract : The energy of collective excited states is calculated under the assumption that the nuclei have an axial symmetry. Conditions are obtained under which the collective excitations can be separated into rotational and vibrational. See also Referat Zhur Fizika, 1958, No 6, 12634 .

Card 1/1

CHINA/Nuclear Physics - Structure and Properties of Nuclei.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5336

Author : Mei Chzhin' yue

Inst : -

Title : Latest Progress in the Field of β -Decay Research

Orig Pub : Kesyue tunbao, Kekhue tongbao, Scientia, Nauchn. vestn, 1959, No 8, 248-250

Abstract : No abstract.

Card 1/1

HUNGARY/Nuclear Physics - Structure and Properties of Nuclei.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5347

Author : Keszthelyi Lajos, Zimanyi Jozsef.

Inst : -

Title : Polarization of β Particles in the Decay of Li^8 .

Orig Pub : Magyar tud. akad. Kozp. fiz. kutato int, kozl., 1958, 6, No 5, 358-360, IV - V

Abstract : The circular polarization of Bremsstrahlung of electrons in the decay of Li^8 is measured. By determining the polarization of the β particles from the polarization of the bremsstrahlung and by comparing the results with those of Lauterung et al. (Referat Zhur Fizika, 1958, No 17, 24701) on the angular $\beta - \gamma$ correlation, the authors reach the conclusion that the spin of the anti-neutrino, arising in the β decay of Li^8 , is parallel to its momentum. The results obtained is in agreement with the Goldhaber result (Referat zhur Fizika, No 7, 1959, 14900). V. Lend'yel

Card 1/1

EAST GERMANY/Nuclear Physics - Structure and Properties of Nuclei.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5369

Author : Hoffman, K.W., Krause, I.Y., Schmidt Ott H.D., Flammersfeld A.

Inst : The University, Gottingen, West Germany

Title : Isomerism of Hf^{179}

Orig Pub : Z. Phys., 1959, 154, No 4, 408-418

Abstract : Using a scintillation spectrometers with a 4π geometry, the authors measured the spectrum of γ rays and conversion electrons of the 19-second isomer of Hf. The newly measured half life was found to be 18.6 ± 0.2 seconds. Starting with the measured spectra, it was possible to determine, along with the energies, also the conversion coefficients of both transitions. For the first transition with energy 161 kev, the total conversion coefficient

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EAST GERMANY/Nuclear Physics - Structure and Properties of Nuclei. C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5369

is $\alpha = 35 \pm 2$, and the coefficient of K conversion $\alpha_K = 19.4 \pm 1.2$, and it is in good agreement with the values calculated for the type M-3 transition. The energy of the second transition was found to be 217 ± 2 kev, and the total conversion coefficient $\alpha = 0.055 \pm 0.010$. In spite of the assumption prevalent heretofore, it follows uniquely from these results that in this transition the emitted radiation is of type E1. Thus, the spin and parity of the ground state and of the excited states of Hf^{179} are in agreement with the sequence of levels for deformed nuclei, given by Nilsson.

Card 2/2

EAST GERMANY/Nuclear Physics - Nuclear Reactions. C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5389

Author : Brix, P., Maschke, E.K.

Inst : The University, Heidelberg, West Germany

Title : Investigation of the Reaction $\text{O}^{16}(\gamma, p)$ Caused by Bremsstrahlung with Maximum Energy of 32 Mev.

Orig Pub : Z. Phys., 1959, 155, No 1, 109-119

Abstract : Measurements have been made of the energy and angular distributions of photoprotons, arising in the $\text{O}^{16}(\gamma, p)$ reaction when a gas target is irradiated with bremsstrahlung with a maximum energy of 32 Mev. The protons were registered by nuclear emulsions Ilford C2, and protons were selected with energies $E_p > 10$ Mev. The energy distribution of the photoprotons has a maximum of $E_p = 11.2$ Mev, corresponding to resonance in the absorption cross

Card 1/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5889

section at $E = 24$ Mev. The angular distributions of photoprotons, measured at a maximum spectrum energy of 28 Mev in the interval from 20° to 160° , are given by the formula $A + B \sin^2 \theta (1 + p \cos \theta)^2$, and if $A/B = 0.15$ and $p = 0.52 \pm 0.07$ for all protons with $E_p > 10$ Mev, then for the individual groups of protons, these quantities increase with increasing E_p (for $E_p = 10.9$ to 11.2 Mev, $A/B = 0.11$, $p = 0.5 \pm 0.3$; for $E_p = 11.4$ to 11.6 Mev, $A/B = 0.16$ and $p = 0.4 \pm 0.3$; For $E_p = 14.4$ to 15.5 Mev, $A/B = 1.0$ and $p = 1.9 \pm 1.3$). The partial cross section of the reaction (γ, p) with formation of N^{15} in the ground state, calculated for $E_\gamma = 28$ Mev from the obtained spectrum by averaging over the 1.2 Mev interval, was found to be 2.1 millibarn $\pm 25\%$. -- B.A. Yur'yev

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5391

Author : Brix, P., Kording, A., Lindenberger, K.H.

Inst : The University, Heidelberg, West Germany

Title : The Reactions (γ, p) and (γ, np) on Ar^{40}

Orig Pub : Z. Phys., 1959, 154, No 5, 569-573

Abstract : To measure the yields of the reactions (γ, p) and (γ, np) on Ar^{40} , the gaseous argon was irradiated by γ bremsstrahlung from the betatron, with maximum energy 34 Mev. The induced β activity of Cl^{39} ($T = 55.5$ minutes) and Cl^{38} ($T = 37.3$ minutes), separated chemically, was measured in a 2π -geometry. The monitor was the induced β activity of Cl^{11} from the reaction $Cl^{12}(\gamma, n)$. Using the resultant ratios of the yields of Cl^{39} and Cl^{38} to the yield of Cl^{11} , and also using data on the cross section of $Cl^{12}(\gamma, n)$

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EAST GERMANY/Nuclear Physics - Nuclear Reactions.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5391

(Referat Zhur Fizika 1956, No 1, 430), the authors have found that the upper limit of the integrated cross section for the (γ ,p) reaction amounts to 160 Mev-barn, and for the reaction (γ ,np) it is equal to 35 Mev-millibarn. The results for $\text{Ar}^{40}(\gamma, p)$ are sharp disagreement with the data of McPhearson, Pederson, and Katz (Referat Zhur Fizika, 1955, No 6, 10999), since the former amount to less than 1/3 of the latter. -- B.A. Yur'yev

Card 2/2

EAST GERMANY/Nuclear Physics - Nuclear Reactions.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5410

Author : Zamjatnin, J.S., Safina, I.V., Gutnikova, E.K., Ivanova, N.I.

Inst : Spectra of Neutrons Produced Upon Passage of 14-Mev Neutrons Through Layers of Fissionable Substances

Orig Pub : Kernessergie, 1959, 2, No 5, 483-486

Abstract : Translation for from the Journal "Atomnaya energiya" [Atomic Energy] 1958, 4, No 4, 337 (Referat Zhur Fizika, 1959, No 1, 463).

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EAST GERMANY/Nuclear Physics - Nuclear Reactions.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5411

Author : Vladimirskij, V.V., Panov, A.A., Radhevic, I.A.,
Sokolovskiy, V.V.

Inst : -

Title : Measurement of the Fission Cross Section of U^{233} and the
Total Effective Cross Sections of As, V, Ta and Bi.

Orig Pub : Kermenergie, 1959, 2, No 6, 589-590

Abstract : Translated from the Journal Atomnaya energiya [Atomic
Energy] 1958, 5, No 1, 69 (Referat Zhur Fizika, 1959,
No 4, 7669).

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EAST GERMANY/Nuclear Physics - Nuclear Reactions.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5430

Author : Kuznecova, M.J., Mechedov, V.N., Chalkin, V.A.

Inst : -

Title : Secondary Nuclear Reactions in the Bombardment of Tin
by Fast Protons

Orig Pub : Kernenergie, 1959, 2, No 5, 460-464

Abstract : Translated from the Journal Atomnaya energiya /Atomic
Energy/ 1958, 4, No 5, 455 (Referat Zhur Fizika, 1958,
No 12, 26987).

Card 1/1

HUNGARY/Nuclear Physics - Nuclear Reactions.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5432

Author : Bozohi Gyorgy, Fenyves Erwin, Gombosi Eva

Inst : -

Title : Investigations of the Interactions Due to 9-Bev Protons
in Photoemulsion

Orig Pub : Magyar tud. akad. kozp. fiz. kutato int. kozl., 1958,
6, No 5, 351-357, IV

Abstract : A procedure is developed for determining the number of
nucleons, η , knocked out of a nucleus as a result of
nuclear interaction with 9-Bev protons. The correlation
between η and the number of emitted cascade particles
and between η and the number of evaporated particles was
investigated. The results obtained are evidence of the
existence of such a correlation. -- V.I. Lend'yel

Card 1/1

HUNGARY/Nuclear Physics - Penetration of Charged and Neutral
Particles Through Matter.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5452

Author : Rossi Bruno

Inst : -

Title : Properties of Cosmic Ray Penetrating Particles at Sea
Level

Orig Pub : Magyar fiz. folyoirat, 1959, 7, No 1, 89-101

Abstract : Translated from Z. Phys. 1933, 82, 151-178.

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YUGOSLAVIA/Nuclear Physics - Cosmic Rays.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5478
 Author : Miklzic, U., Zupancic, C.
 Inst : -
 Title : Measurement of the Bremsstrahlung Spectrum from a 30-Mev
 Betatron with a Compton Electron Spectrometer
 Orig Pub : Repts. J. Stefan Inst., 1958, 5, 3-8
 Abstract : No abstract.

Card 1/1

EAST GERMANY/Nuclear Physics - Cosmic Rays.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5485
 Author : Muhlschlegel, B.
 Inst : The University, Heidelberg, West Germany
 Title : Depolarization of β Particles Due to Scattering in
 Radioactive Compound
 Orig Pub : Z/ Phys., 1959, 155, No 1, 69-76
 Abstract : The depolarization of particles, due to scattering in
 a source, is considered. The value of the depolarization
 is calculated for the case of multiple scattering at small
 angles. The mean square of the scattering angle $\bar{\Theta}^2$
 for a fixed source thickness is calculated on the basis
 of the Moliere theory (Moliere G., Z. Naturforsch 1948,
 3a, 78). The relative depolarization in this case is
 found to be $\Delta P/P_0 = [(1-\beta^2)/4] \bar{\Theta}_0^2(a)$.

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EAST GERMANY/Nuclear Physics - Cosmic Rays.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5485

For the usually employed thicknesses of sources, the value of the depolarization due to multiple scattering is found to be on the order of several percent. The estimate of the depolarization, due to single scattering at large angles, gives a magnitude of the same order as the considered multiple scattering. -- V.P. Parfenova

Card 2/2

EAST GERMANY/Nuclear Physics - Cosmic Rays.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5491

Author : Marcuh, G.I., Michajlus, F.F.

Inst : -

Title : Resonant Absorption of Neutrons in an Infinite Homogeneous Medium

Orig Pub : Kernenergie, 1959, 2, No 3, 220-228

Abstract : Translation from the Journal "Atomnaya energiya" /Atomic Energy/ 1958, 4, No 6, 520.
See Referat Zhur Fizika, 1959, No 2, 2890.

Card 1/1

EAST GERMANY/Nuclear Physics - Nuclear Power and Technology.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5514

Author : Korolev, V.V., Sidorova, I.I.

Inst : -

Title : Electric Simulation of Nuclear Reactors.

Orig Pub : Kernenergie, 1959, No 5, 464-475

Abstract : Translated from the Journal "Atomnaya energiya" / Atomic Energy / 1958, 5, No 1, 29 (Referat Zhur Fizika, 1959, No 4, 7766).

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EAST GERMANY/Nuclear Physics - Nuclear Power and Tehhnology.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5516

Author : Kovanic, P., Kulka, M.

Inst : -

Title : Complex Automatization of Reactor Control.

Orig Pub : Kernenergie, 1959, 2, No 5, 476-481

Abstract : Translated from the Journal "Atomnaya energiya" /Atomic Energy/ 1958, 5, No 4, 403 (Referat Zhur Fizika, 1959, No 8, 17524).

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EAST GERMANY/Nuclear Physics - Nuclear Power and Technology.

C-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5555
Author : Kurcatov, I.V.
Inst : -
Title : Certain Activities of the Institute of Atomic Energy
Academy of Sciences USSR on Controllable Thermonuclear
Reactions.
Orig Pub : Kernenergie, 1959, 2, No 5, 435-441
Abstract : See Referat Zhur Fizika, 1959, No 4, 7689.

Card 1/1

POLAND/Atomic and Molecular Physics - Statistical Physics.
Thermodynamics.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5587
Author : Olszuwski, S.
Inst : Institute of Physical Chemistry, Polish Academy of
Sciences, Warsaw
Title : Nuclear Charge Effect on the Free-Electron Model Energy
States
Orig Pub : Acta phys. polon., 1959, 18, No 2, 107-120
Abstract : A computation scheme is proposed, which makes it possible
to take into account the effect of positive charges on the
energy states in the linear metallic model. The specific
calculations are carried out for ethylene and butadiene
under the assumption of equidistant placement of the posi-
tive centers along the axis of the potential tube, as the

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POLAND/Atomic and Molecular Physics - Statistical Physics.
Thermodynamics.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5587

Radius of the latter tends to zero. The results obtained for the lowest excited singlet states are in good agreement with the calculations corresponding to the states by the LCAO MO method, if a strong screening of the nucleus is assumed. The scheme proposed is applicable also to the calculation of the position of the absorption maximum, corresponding to the lowest electron transitions in $\text{Me}^{2+}\text{N}(\text{CH}(\text{CH})_k)_2\text{NMe}_2$. The results of the calculation are in good agreement with experiment, if it is assumed that a free electron pair is localized on the nitrogen atom. Allowance for the nuclear interaction with the electrons in the metallic model causes the electron states to form electron zones, analogous to the Brillouin zones in solids. -- A.I. Osipov

Card 2/2

HUNGARY/Atomic and Molecular Physics - Statistical Physics.
Thermodynamics

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5595

Author : Berencs Ferenc

Inst : Egyetemi Elmeleti Fiz. Intezet, Szeged. Hungary

Title : Account of Hybridization in the Hydrogen Molecule

Orig Pub : Magyar fiz. folyóirat, 1959, 7, No 1, 61-66

Abstract : It is shown that account of polarization of the electron cloud in the atom leads, in calculating the binding energy of the molecule, to an effect of equal importance (in order of magnitude), as account of the electron correlation. Detail calculations are given for the hydrogen molecule.

Card 1/1

EAST GERMANY/Atomic and Molecular Physics - Statistical Physics. D-
Thermodynamics.

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5627
Author : Ardenne Manfred
Inst : -
Title : Progress in the Mass Spectrometry of Polyatomic Molecules
Orig Pub : Z. Angew. Phys., 1959, 11, No 4, 121-131

Abstract : The author describes a precision molecular mass spectrometer with an ion source, producing ions through fussion of the electrons to neutral polyatomic molecules. Such a mass spectrometer is capable of determining the molecular weights accurate to one mass for substances with masses (M) greater than 1,000. The possibility of experimental determination of the mass spectra of polyatomic molecules without disintegrating them, and also the formation of negative molecular ions as a result of the fussion of the electron to the molecule, is explained by the production

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EAST GERMANY/Atomic and Molecular Physics - Statistical Physics. D-
Thermodynamics.

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5627

of the high precision ion source with extremely high density of slow electrons and relatively high density of molecular vapor. The construction and the operating principle of such an ion source are described. One can consider the great accomplishment to be the production in the source of an evaporation system with simultaneous feeding of the analyzed and standard vapor, the mass-spectrum lines of which have equal intensity. The resolving power of the mass spectrometer reaches values from 2500 to 4, 00. Spectrograms are given of higher alcohols with M ranging from 230 to 269. It is indicated that if the instrument is well adjusted mass spectra can be obtained for oils with ion groups ranging from M 450 to 700, and also for substances with M up to 900. -- G.D. Karstew

Card 2/2

EAST GERMANY/Atomic and Molecular Physics. - Statistical Physics. D-
Thermodynamics.

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5628
Author : Ardenne Manfred von
Inst : -
Title : Progress in Mass Spectrometry of Polyatomic Molecules
Orig Pub : Wiss. Z.E.M. Arndt-Univ. Greifswald. Math.-Naturwiss.
Rune, 1957 -1958, 7, No 3-4, 161-174
Abstract : See Abstract 5672.

Card 1/1

CHINA/Atomic and Molecular Physics - Heat D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5646
Author : Yan'Tsz"-tszyun'
Inst : -
Title : Equation of State of Real Gases
Orig Pub : Kesyue tszin'zhan', Kekhue jinzhan, 1958, No 2, 45-46
Abstract : No abstract.

Card 1/1

EAST GERMANY/Atomic and Molecular Physics - High Pressure Physics. D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5680

Author : Straubel Harald

Inst : -

Title : Use of the Curie Point in Ferrites for Temperature Control

Orig Pub : Z. Angew Phys., 1959, 11, No 5, 172-174

Abstract : In magnetically-soft ferrites, the variation of the magnetic permeability with the temperature has a very sharp variation near the Curie point. Such a property makes it possible to use such ferrites for control and regulation. Examples of several instruments are given (thermostats, water-operated switches for diffusion pumps, switches for liquid air), in which magnetically-soft ferrites are used. They can be used also for the measurement of radiation.

Card 1/1

POLAND/Atomic and Molecular Physics - High Pressure Physics. D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5681

Author : Sivietoslawski, W., Zielenkiewicz, W.

Inst : Institute of Chemical Physics, Polish Academy of Sciences

Title : Thermostats Used with the Labyrinth Flow Calorimeter

Orig Pub : Bull. Acad. polon. sci. Ser. sci. chem., geol. et geogr., 1959, 7, No 2, 107-110

Abstract : Description of a thermostat for a labyrinth-flow calorimeter (Abstract 5683). The thermostat contains 400 liters of water. To stir such an amount of water, four propeller stirrers are used. In addition to the automatic apparatus for the control of the temperature, the thermostat contains also a Beckman ultrathermometer for detecting very small water temperature fluctuations. The changes in temperature in the thermostat did not exceed $\pm 0.001^\circ \text{C}$ in 14 days.

-- T.V. Zakharova

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POLAND/Atomic and Molecular Physics - High Pressure Physics.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960. 5683

Author : Swietoslawski, A., Zielenkiewicz, A.

Inst : -

Title : On a New Labyrinth Flow Calorimeter

Orig Pub : Bull. Acad. polon. sci, Ser. sci. Chem. geol. et geogr.,
1959, 7, No 2, 101-105

Abstract : The authors describe a labyrinth water-flow calorimeter (LFC) for long-duration thermal processes, based on the principle of heat exchange between the reacting mixture or another measurement object and water flowing uniformly through all the channels of two labyrinths. To determine the heat liberated by the body per unit time, it is necessary to measure the difference $t_2 - t_1$ between the temperatures of the water leaving (t_2) and entering (t_1) in the LFC, and the amount of water, V , flowing per unit time through the channels of LFC. The advantage of this type

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POLAND/Atomic and Molecular Physics - High Pressure Physics.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5683

of calorimeter is that to measure the thermal effect it is not necessary to know the specific heat of the investigated object. In the LFC use is made of automatic devices for measuring V accurate to $\pm 0.1\%$, and for measuring $\Delta t = t_2 - t_1$ with a maximum error of $\pm 0.001^\circ \text{C}$. The LFC is placed in a water thermostatic bath, surrounded by an air thermostatic bath. Constant temperature is maintained in the thermostatic bath, accurate to $\pm 0.001^\circ \text{C}$. The LFC makes it possible to determine the thermal effects on the order of 1 cal/hr under the condition that the rate of flow of the liquid is 500 ml/hr. The LFC is calibrated by means of an electric heater made of manganin. -- T.V. Zakharova

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5701

Author : Karapet'yants M.Kh., Chen Guan-yue

Inst : -

Title : Temperature Dependence of Vapor Pressure. I. Combined Method of Calculation in Series of Similar Substances

Orig Pub : S'chun'dasyue syuebao (tse"zhan'kesyue). Sichuan daxue xuebao. Ziran kexue, Acta scient. natur. Univ. szechuan., 1958, No 2, 91-104

Abstract : The authors have evaluated and verified certain of the most accurate methods of calculating the temperature dependence of vapor pressure of individual substances. In particular, an evaluation is made of methods of comparative calculation, for which certain quantitative coefficients are introduced to permit application of these methods to homological series. It is shown that in the case of series of similar substances, the most productive

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5701

is the method of comparison of the boiling temperature function for equal pressure. On the basis of the results obtained, a combined method of calculating the P-T dependence has been obtained and verified. It is based on the application of the following equation for interpolation

$$\lg P = a' \frac{b'}{c' + x} \quad (1)$$

and the following equation for extrapolation

$$\lg T = a + b \lg T, \quad (2)$$

with the equations for extrapolation by substances being

$$a = A + B \lg n + C \lg^2 n + D \lg^3 n, \quad (3)$$

$$\lg b = A' + B' \lg n + C' \lg^2 n + D' \lg^3 n; \quad (4)$$

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5701

Here a , b , and a' , b' , and c' are the individual constants, while A , B , C , D and A' , B' , C' , D' are the constants for a given series, n is the number of CH_2 groups in the alkyl radical. In the presence of P-T data for four substances (including the standard) it is possible to estimate with the aid of Eqs. (3) and (4) the temperature dependence of the vapor pressure of the uninvestigated higher homologues. If the interval of temperature variation for the considered substance is greater than for the standard substance, the latter can be broadened by means of a method of inverse calculation, which will be treated in Part II of the paper.
Bibliography, 29 titles.

Card 3/3

CHINA/Atomic and Molecular Physics - High Pressure Physics.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5702

Author : Chen Guan-yue, Karapet'-yants M.Kh.

Inst : -

Title : Temperature Dependence of Vapor Pressure. II. Normal Alkanes

Orig Pub : S'chuan' dasyue syuebao (tsi'zhan' Resyue), Kexue. Vestn. S'chuan'sh. un-ta (Ser. estest'. N.), Acta scient. natur. Univ., 1959, No 1, 97-110

Abstract : For Part I see Abstract 5701.

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HUNGARY/Atomic and Molecular Physics - High Pressure Physics.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5731

Author : Borbely Samu

Inst : -

Title : Investigations Connected with Nonlinear Heat Conduction

Orig Pub : Magyar tud. akad. Musz. tud. oszt. kozl., 1959, 23,
No 3-4, 261-283. Hozzaszolasok, 284-286

Abstract : If the coefficient of heat conduction in the known Fourier equation for heat conduction is considered to be the variable, then the equation becomes nonlinear and its solution involves unsurmountable mathematical difficulties. By generalizing the experimental results, the author develops an approximate method of solving the equations of heat conduction.

Card 1/1

EAST GERMANY/Atomic and Molecular Physics - Gases.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5784

Author : Minnigerode Gunther von

Inst : First Physics Institute, The University, Gottingen,
West Germany

Title : Effect of Lattice Imperfections on the Critical Temperatures of Different Superconductors

Orig Pub : Z. Phys., 1959, 154, No 4, 442-459

Abstract : For pure Tl, Sn, In, Nb, Pb, Hg, and Al (with impurities less than 0.01%) an investigation was made of the effect of physical distortions of the crystal structure on the critical temperature T_c . For this purpose thin foils (10 microns) of metals were obtained by cold working (transverse rolling) at helium temperatures. It was found that T_c shifts in this case by several tenths of a degree

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 5784

(usually $\Delta T_c > 0$). Annealing removes these changes of T_c . It is shown further that the condensation of films of these metals on crystalline quartz at medium temperatures causes changes in T_c , coinciding in sign with ΔT_c due to plastic deformation. (Exceptions are Nb and Al, which are related with their chemical activities with respect to the residual gas during the process of film evaporation). A similar action is exerted by rolling of the films after their annealing. A conclusion is drawn that the shifts in T_c in films deposited at low temperatures are due essentially to physical lattice imperfections. --
P.A. Chentsov

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5837

Author : Ganti Tibar

Inst : -

Title : Investigation of a Mixture of Ethyl Alcohol and Water
by X-Ray Diffraction

Orig Pub : Magyar fiz. folyoirat, 1959, 7, No 1, 19-35

Abstract : The article contains a survey of data on x-ray investigation of structure of mixtures of various liquids, and also a description of the research being done on the structure of the mixture of ethyl alcohol and water. The intensity of the outermost maximum, due to the structure of the water, was investigated. At an alcohol contents up to 72%, the maximum can still be clearly observed, but when the alcohol contents becomes 82.5%, it drops out completely. This is evidence that starting with these concentrations all the water molecules participate in the hydration of the ...

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HUNGARY/Atomic and Molecular Physics - Liquids

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5837

alcohol. Photographs, tables, and graphs are given to illustrate this statement.

Bibliography, 17 titles. -- V.I. Lend'yel

Card 2/2

EAST GERMANY/Atomic and Molecular Physics - Liquids

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5844

Author : Pawitsch, M.I.

Inst : -

Title : Heterogeneous Equilibriums in Water-Salt Systems at High Temperatures

Orig Pub : Freiburger Forschungsh., 1959, A, No 123, 269-286.
Diskuss., 286.

Abstract : No abstract.

Card 1/1

CZECHOSLOVAKIA/Atomic and Molecular Physics - Physics of Polymers. D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5940

Author : Majer Josef

Inst : Research Institute for Macromolecular Chemistry, Brno,
Czechoslovakia

Title : Effect of Temperature on Viscosity of Molten Polyethylene

Orig Pub : Chem. prumysl, 1959, 9, No 4, 219-220

Abstract : Using an extrusion plastomer, the author measured the activation energy E_a of the flow of polyethylene (I) at a constant value of the shear stress $\tau = 8.14 \times 10^5$ dyne/cm². The value of E_a amount to 6.8 kcal/mole for I of low pressure (Ziegler type and 11.4 kcal/mole for I of high pressure, and these values do not change in the investigated range of the yield factor in specimens with identical prior history. Different values of E_a of

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CZECHOSLOVAKIA/Atomic and Molecular Physics - Physics of Polymers. D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5940

polyethylenes prepared by different ways, are apparently due to the influence of branching.

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YUGOSLAVIA/Atomic and Molecular Physics - Physics of Polymers.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5942

Author : Vene, N., Mohorcic, G.

Inst : -

Title : Viscosity and Light Scattering of Solutions of Polyacenaphthylene

Orig Pub : Pepts J. Stefan Inst., 1958, 5, 71-79

Abstract : Measurements have been made in solutions of polyacenaphthylene in tetrahydrofuran of the viscosity $[\eta]$ in the concentration region from 6×10^{-4} to 60×10^{-4} g/cm³ at $20.00 \pm 0.01^\circ$ C and the light scattering was measured at concentrations 10^{-5} -- 40×10^{-5} g/cm³ at 20° C. The constants are obtained in the equations $[\eta] = kM^a$; $[\eta] = \Phi R^3/M$, $R^2 = aM + b$, where M is the molecular weight and k and a are constants, R^2 is the average value of the square of the distance between the ends of the molecules, and Φ is a constant independent of the concentration and

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YUGOSLAVIA/Atomic and Molecular Physics - Physics of Polymers.

D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5942

temperature for all flexible linear polymers. It is shown that the polyacenaphthylene behaves in a solution like chain molecules with side groups of the polystyrol type.

Bibliography, 20 titles. -- T.V. Zakharova

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CZECHOSLOVAKIA/Atomic and Molecular Physics - Physics of Polymers. D-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5947

Author : Pavlinec Mir

Inst : -

Title : Photoelasticity Constant and Optical Sensitivity of
Certain Materials

Orig Pub : Jemna Mech. a opt., 1959, 4, 126-127

Abstract : The principles underlying the measurement of photoelasticity are briefly described, and the photoelasticity constant K is described. Values of K are given for artificial resins, celluloid, and glass. In practice one employs instead of K the optical sensitivity of model materials, given by small k $1/K$. A classification is proposed for materials on the basis of the value of k . The values of k are given for certain materials (flints, polymethylmethacrylates, and phenolformaldehydes).

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POLAND/Solid State Physics - Solid State Theory.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5969

Author : Buras Bronislaw, O'Connor Denis

Inst : -

Title : The Neutron-Phonon Interaction in Solids

Orig Pub : Nukleonika, 1959, 4, No 2, 119-140

Abstract : No abstract.

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POLAND/Solid State Physics - Solid State Theory.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5972

Author : Sledzih Jan

Inst : -

Title : Modified Bohm and Pines Collective Description of Electron Interactions in Crystals. II.

Orig Pub : Acta phys. polon., 1959, 18, No 1, 57-73

Abstract : The author considers the canonical transformation that eliminates the interaction operator from the Hamiltonian. It is shown that this transformation leads to changed supplementary conditions and to a new Hamiltonian. The transformation is applied not accurately, but also in the approximation of the first commutator with a generating transformation function. By virtue of this, the resultant assembly of additional conditions and the new Hamiltonian are considered more readily as postulated, than as correctly derived. Generalized dispersion relations are obtained.

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POLAND/Solid State Physics - Solid State Theory.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 5972

For Part I see Referat Zhur Fizika 1960, No 1, 1003.

Card 2/2

EAST GERMANY/Solid State Physics - Structural Crystallography.

E

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6019
Author : Laue Max
Inst : -
Title : X-Ray Wave Fields in Crystals.
Orig Pub : V. Sitzungsber. Dtseh. Akad. Wiss. Berlin kl. Math.
Phys. und Techn., 1959, 26 S., ell.)
Abstract : No abstract.

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HUNGARY/Solid State Physics - Structural Crystallography.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6022
Author : Keglerich Laszlo
Inst : -
Title : Statistics of Intensities in the Investigation of X-ray
Fine Structure.
Orig Pub : Magyar fiz. folyoirat, 1959, 7, No 1, 81-88
Abstract : No abstract.

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HUNGARY/Solid State Physics - Structural Crystallography.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6023
Author : Keglerich Laszlo
Inst : -
Title : Methods of Investigating Intensity Statistics and Their Application.
Orig Pub : Magyar fiz. folyoirat, 1959, 7, No 2, 145-166
Abstract : No abstract.

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EAST GERMANY/Solid State Physics - Structural Crystallography.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6027
Author : Rajewsky Boris, Heuss Kurt
Inst : Max Planck Institute of Biophysics, Frankfurt am Main, West Germany
Title : 5-kw X-ray Tube with Cylindrical Anode
Orig Pub : Z. angew. Phys. 1959, 11, No 4, 147-149
Abstract : The authors describe a 5-kw x-ray tube, the anode of which is a hollow cylinder of aluminum, 480 mm long and 80 mm in diameter; the cathode consists of eight tungsten wires 0.4 mm in diameter, stretched on the outside of the cylinder parallel to its axis. The radiation immerges from the inside of the hollow cylindrical anode. The overall area of the radiating surface is 750 cm². The tube gives a large and uniformly distributed power (doses on the order

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EAST GERMANY/Solid State Physics. - Structural Crystallography.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6027

of 2,000 r/min at the center of the anode), and is suitable for continuous irradiation (for example, in sterilization). -- T.N. Tarkhova

Card 2/2

POLAND/Solid State Physics - Phase Equilibria, Phase Conversions.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6074

Author : Hajciechawski Kazimierz

Inst : -

Title : Theory of Order in Fe₂Al Alloy

Orig Pub : Acta phys. polon., 1959, 18, No 1, 15-20

Abstract : A statistical theory is proposed for the process of ordering in the Fe₂Al alloy. The expression for the configurational energy of the alloy is written with allowance for the interaction of the given atom with atoms located on the first three coordination spheres. The state of thermodynamic equilibrium is obtained from the condition of the minimum of free configurational energy. The ordering temperature is expressed in terms of the interaction energies V(2) and V(3) of the given atom with the atoms of the second and third coordination spheres respectively. The experimental value of the ordering temperature

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POLAND/Solid State Physics - Phase Equilibria. Phase Conversions. E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6074

(530° C) leads to the expression $2 V(3) = V(2)$. --
V.V. Shmidt

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EAST GERMANY/Solid State Physics - Crystallization. E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6105

Author : Packter, A.

Inst : The University, London, Great Britian

Title : Studies on the Crystal Growth of Soluble Metal Salts.
Part II -- The Factors that Determine the Particle Size
of Crystals Grown by Cooling Hot Supersaturated Solutions

Orig Pub : Z. Phys. Chem. (DDR), 1959, 210, No 3-4, 196-208

Abstract : In Part I (Referat Zhur Fizika, 1956, No 9, 25737) a report was made on the influence of protective substances on the reaction occurring on crystalline surfaces. In the present paper, considering the growth of the crystal as a process consisting of two stages, namely the formation of the nucleus and its subsequent growth, the author has made an experimental and theoretical study of the

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Abs Jour : Ref Zhur Fizika, no 3, 1960, 6105

factors that determine the size of the crystal particles upon cooling at different rates (0.004 -- 4.7 deg/sec) of hot supersaturated solutions of salts of metals. It is shown that at low rates of cooling, the size of the precipitating crystals in inverse proportion to the rate of cooling and the rate of formation of supersaturation in accordance with the law of effective masses. In rapid cooling the principal growth of the crystal begins after the solution reaches the final temperature and the dimension of the crystals depends on the final supersaturation in accordance with the law of effective masses.
-- O.S. Zaytsev

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6130

Author : Gerold, V., Meier, F.

Inst : Max Planck Institute for Metal Research, Stuttgart, West Germany

Title : X-Ray Diffraction Observation of Dislocations in Germanium

Orig Pub : Z. Phys., 1959, 155, No 4, 387-394

Abstract : The method of anomalous absorption of x-rays in a parallel beam (Referat Zhur Fizika, 1959, No 7, 15377) makes it possible to obtain projections of disturbances to the periodicity of the lattice. This method was used to study the spatial distribution of dislocations in plates 0.7 -- 1 mm thick, cut out of germanium crystals with dislocation densities 100 -- 1,000 lines per cm^2 . The reflecting planes were chosen to be the (220) planes, since they exhibit

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EAST GERMANY/Solid State Physics - Crystal Morphology.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6130

a maximum anomalous absorption effect. From the placement and form of the projections of the dislocations on the x-ray photographs at different directions of the incident rays, one can determine that the majority of the dislocations lie in the (111) planes. The contrast of the image of the dislocation on the photograph depends in a definite manner on the angle between the Burgers vector and the normal to the reflecting plane. Using this, the authors have found that in the given case the Burgers vector lies also in the (111) plane, which, thus, is the slip plane of the dislocations. It was impossible to interpret the phenomenon of the reduction in the contrast of the image with decreasing angle between the directions of the dislocation line and the wave field.

Card 2/2

EAST GERMANY/Solid State Physics - Recrystallization.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6138

Author : Bocvar, A.A., Tomson, G.I., Cebatarev, N.I.

Inst : -

Title : Recrystallization of Uranium Under the Influence of Cyclic Heat Treatment

Orig Pub : Kermenergie, 1959, 2, No 4, 386-389

Abstract : Translated from the Journal "Atomnaya energiya" /Atomic Energy/ 1958, 4, No 6, 555.
See Referat Zhur Fizika 1959, No 4, 8192.

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EAST GERMANY/Solid State Physics - Mechanical Properties.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6155

Author : Bunge, H.J.

Inst : Institute for Structure Research, German Academy of Sciences, Berlin, East Germany

Title : On the Determination of Fiber Textures

Orig Pub : Monatsber. Dtsch. Akad. Wiss. Berlin, 1959, 1, No 1, 27-31

Abstract : In the study of the texture of polycrystalline materials with the aid of pole figures, one obtains the density of distribution $R_H(\Phi)$ of the normals of the reflecting planes of the lattice $H = \{hkl\}$ relative to the axis of the fiber (Φ is the angle with the axis of the fiber). For a quantitative estimate of the textures, it is more convenient to consider the density of distribution, T ,

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EAST GERMANY/Solid State Physics - Mechanical Properties.

E-

Abs Jour : Ref Zhur Fizika, no 3, 1960, 6155

of the axis of the fiber relative to the crystallographic axes $[100]$, $[110]$, and $[111]$, forming a triangle, represented in stereographic projection. The quantities T and R_H are related by

$$R_H(\Phi) = T_H(\Phi) = \frac{1}{2\pi} \int_0^{2\pi} T(\Phi, \beta) d\beta.$$

with $R_H(\Phi = 0) = T(\Phi = 0)$. A method is proposed for determining the value of T by expanding the measured function $R_H(\Phi)$ in a Fourier series. This method of calculation of the distribution of the orientations of the crystallites of the polycrystalline specimen is analogous to considerable extent to the method of structural analysis of obtaining the distribution of the electron density in the elementary cell of a crystal, but is simpler.

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EAST GERMANY/Solid State Physics - Mechanical Properties.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6155

The applicability of the method was verified by determining the texture of an aluminum wire (degree of drawing 40%). Data are obtained for the three pole figure, (111), (100), and (110), coincide and are evidence of the presence of a double texture $[100]$, $[111]$ in the specimen, and the intensity of the orientation of $[100]$ is twice as large. The errors amount to approximately 15% of the maximum value of the distribution density. -- M.M. Borodkina

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EAST GERMANY/Solid State Physics - Mechanical Properties.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6187

Author : Stiller, H.

Inst : Laboratory for Technical Physics, Technical College, Munich, West Germany

Title : Internal Friction as a Consequence of Order-Change Processes

Orig Pub : Ann. Phys. (DDR), 1959, 3, No 5-6, 283-297

Abstract : Based on the attenuation of torsional oscillations, an investigation was made of the temperature dependence of the internal friction in alloys AgPt, AgMn, AgZn, AgMg, and AuCd of various compositions. In the interval from 20 to 500° C, two absorption maxima were found in the alloys AgZn, AgMg, and AuCd, and only one in the AgMn alloy and none in AgPt. The maximum in AgZn is of the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6187

same type as that obtained by Novik, and is connected with the change in the position of the Zn atoms. It is shown that the observed dependence of absorption on the concentration does not agree with the Zeener hypothesis. The reasons for this disagreement are explained on the basis of the Friedel theory. The maxima in AuCd and AgMg are analogous in width and concentration dependence to the maxima in AgZn. They are also connected with the changes in the positions of the pairs of the atoms of the dissolved component. The fact that the maxima of absorption at high temperatures lie as in AgZn is explained by the exchange of the Cd5s -- Au5d electrons and, Mg3s -- Ag4d respectively. These exchanges serve as a base for the formation of ordered phases U_3Cd , AuCd, AgMg, and $AgMg_3$. The absence of absorption, connected with the changes in the positions of the dissolved atoms in the alloys AgMn and AgPt is explained by the fact that in these mixed

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6187

crystals the atoms of the dissolved components are distributed statistically and their order is also connected with the exchange interaction with atoms of the solvent.
-- V.R. Regel'

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CZECHOSLOVAKIA/Solid State Physics - Effect of Irradiation on
Structure and Properties.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6209

Author : Trnka Jaroslav

Inst : Institute of Technical Physics, Czechoslovak Academy
of Sciences, Prague, Czechoslovakia

Title : A Contribution to the Study of the Thermal Properties of
NaCl:Ca Crystals Irradiated with X-Rays.

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 6, 749

Abstract : To investigate the influence of x-ray irradiation in the
process of annealings the temperature difference ΔT
of the irradiated and non-irradiated crystals was regis-
tered. Crystals with molecular contents of 0.2, 0.05,
0.002% of calcium were investigated. The x-ray irradia-
tion was at 50 kv and 30 ma through a beryllium window

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CZECHOSLOVAKIA/Solid State Physics - Effect of Irradiation on
Structure and Properties.

E-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6209

for two hours. In each of the experiments a maximum was
observed on the curve showing the dependence of ΔT on
the oven temperature. With the increasing calcium con-
centration, the position of the maximum shifted towards
the lower oven temperatures. -- R.I. Garbev

Card 2/2

EAST GERMANY/Magnetism - Diamagnetism. Paramagnetism.

F-

Abs Jour : Ref Zhur Fizika, , Mp 3, 1960, 6225

Author : Grossmann Gisbert

Inst : Leningrad State University

Title : Magnetic Chemical Investigations of the System FeO_{1+x} .
 MgO ($0 < x < 0.5$)

Orig Pub : Z. anorgan. und allgem. Chem., 1959, 299, No 5-6,
271-280

Abstract : The magnetic susceptibility of 15 specimens of FeO_{1+x} .
 0.925MgO ($0 \leq x \leq 0.5$) was measured at 700, 750, 800,
850, and 900° C. The results are compared with those cal-
culated theoretically for definite conditions, and also
with the magnetic susceptibility of the system Fe-O,
measured earlier. The isotherms of the susceptibility of
magnesio wustite ($\text{FeO}_{1+y} \cdot 0.925\text{MgO}$)(I) and wustite

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EAST GERMANY/Magnetism - Diamagnetism. Paramagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6225

(FeO_{1+y}) make it possible to make several conclusions
regarding the structure of the phase of I. It is quite
probable that both in wustite and in I the Fe^{3+} ions
are present in the form of accumulations. These "super-
microinhomogeneities" do not mean, however, that I from
the point of view of thermodynamics consists of two solid
phases. The interval of homogeneity in phase I at 700° C
lies between $\text{FeO}_{1.04} \cdot 0.925\text{MgO}$ and $\text{FeO}_{1.09} \cdot 0.925\text{MgO}$, and at
900° C it lies between $\text{FeO}_{1.015} \cdot 0.925\text{MgO}$ and approximately
 $\text{FeO}_{1.11} \cdot 0.925\text{MgO}$. For specimens lying in the region of
homogeneous phase I, the Curie-Weiss law is satisfied.
In the case of high contents of oxygen ($x > 0.1$) as a
result of the appearance of the second solid phase of vari-
able concentration, the dependence of the susceptibility
in the composition becomes very complicated.

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EAST GERMANY/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6238

Author : Ruske, H.

Inst : Institute for Magnetic Materials, Jena, East Germany

Title : Thin Nickel Films with Large Value of Coercive Force
and With Large Stored Magnetic Energy

Orig Pub : Ann. Phys. (DDR), 1959, 3, No 5-6, 323-326

Abstract : An investigation was made of the magnetic properties of cylindrical multi-layer specimens of nickel with inter-layers of copper as a function of the applied pressure along the axis. It is possible to obtain in this manner values $H_c \sim 1,000$ oersted and more and stored energies of $\sim 3.5 \times 10^6$ gauss-oersted in the volume of the nickel. Such high values of H_c and $(BH)_{max}$ could be obtained previously only in thin annealed films ($d_{Ni} \sim 150 - 700 \text{ \AA}$).

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EAST GERMANY/Magnetism. Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6238

The effect of the thickness of the film on H_c is reinforced by the application of external pressure.

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CZECHOSLOVAKIA/Magnetism. - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6241
Author : Kaezer Jan, Gemperle Richard
Inst : -
Title : Remarks on the Paper by Specek "Structure of Surface
Closing Domains on the (100) Surface in Iron"
Orig Pub : Ceskosl. casop. fys., 1959, 9, No 1, 115
Abstract : Refers to Referat Zhur Fizika 1959, No 6, 13206.

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CZECHOSLOVAKIA/Magnetism.- Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6242
Author : Kaczer Jan
Inst : -
Title : Maze Patterns on Silicon Iron
Orig Pub : Ceskosl. casop. fys., 1958, 8, No 6, 742-743
Abstract : The author considers the cause of the occurrence of a
maze pattern on silicon iron. It is proposed that the
maze patterns produced around the surface of the speci-
men only in the case when the specimen is subjected to
cylindrical compression. In the case of such a compres-
sion, the specimen becomes a single-axis magnet. In
other words, if the end surface of the specimen is in
the plane $z = 0$, then there takes place $\sigma_{xx} = k$ $\sigma_{yy} = -p$,
 $\sigma_{zz} = 0$, where σ_{xx} , σ_{yy} , and σ_{zz} are the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6242

principal stresses, k a positive constant, and p the pressure. The foregoing assumption is confirmed by the following experiment. A cylinder 8 mm in diameter and 10 mm long was cut from a single crystal of silicon iron. The axis of the cylinder was chosen in one of the principal crystallographic directions. One end of the cylinder was electrolytically polished, and a microphotograph of its domain structure was taken. The specimen was then subjected to a radial compression with a stress $\sim 10 \text{ kg/nm}^2$. Under such a compression, the linear structure of the domains was converted into a zig-zag structure. After removing the compression, the initial structure was restored. The appearance of maze pattern in silicon iron is due to elastic stresses near the surface of the specimen under the influence of radial pressure.

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6243

Author : Kaczer Jan

Inst : -

Title : Maze Patterns on Silicon Iron.

Orig Pub : Chekhosl. fiz, zh., 1958, 8, No 6, 747-748

Abstract : See Abstract 6242.

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EAST GERMANY/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6248

Author : Andra H.

Inst : Institute for Magnetic Materials, Jena, East Germany

Title : Magnetic Powder Patterns at High Temperatures

Orig Pub : Ann. Phys. (DDR), 1959, 3, No 5-6, 334-339

Abstract : A suspension was obtained, making it possible to investigate the domain structure up to 400° C. It was made by introducing smoke from burned $\text{Se}(\text{CO})_5$ (or from an arc discharge between iron electrodes) into paraffin oil. To prevent coagulation of the particles, calcium soap is introduced in the suspension. The necessary fractionization and separation of the conglomerates is obtained with the aid of ultrasound (frequency 800 kcs). The suspension is deposited on the surface of a specimen at the

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EAST GERMANY/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6248

investigated temperature. The observation of the figures is carried out at room temperature with the suspension dried. The suspension described has a smaller resolving power than the ordinary suspension. It is possible, however, to increase its qualities and principles by a more suitable combination of the powder, liquid, and substance preventing the coagulation, and also through the application of a dispersion procedure. See Referat Zhur Fizika, No 12, 1956, 34911. -- A.A. Glazer

Card 2/2

POLAND/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6252

Author : Morkowski Janusz

Inst : Institute of Physics, Polish Academy of Sciences, Warsaw

Title : Reversible Susceptibility under Stress

Orig Pub : Acta phys. polon., 1958, 17, No 6, 435-453

Abstract : A measurement was made of the reversible susceptibility of polycrystals of nickel, subjected to tension (up to 21 kg/mm²) and compression (to 14 kg/mm²) in magnetic fields up to 68 oersteds. During tension, the reversible susceptibility decreases in the region of weak fields and increases in stronger fields. Small compression stresses (up to 3 kg/mm²) cause the opposite effect. The compression above 3 kg/mm² leads to a reduction in the reversible susceptibility at all values of the magnetic

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POLAND/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6252

field. Experimental data are compared with the calculated ones, based on statistical theory.

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RUMANIA/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6253
Author : Procapiu Stefan, Lutovan Vasile
Inst : University of Iasi, Bucharest, Rumania
Title : Change in the Permeability of Iron Wires under the
Influence of Tension up to and above the Elastic Limits.
Orig Pub : Studii si cercetari stiint, Acad. RPR Fil. Iasi. Fiz. si
stiinte tehn., 1958, 9, No 1, 11-15

Abstract : The hysteresis loops of iron wires, first subjected to
elastic deformation (first state) and then to plastic
deformation (second state) were measured. The measure-
ments were carried out by a ballistic method. Data are
given on the variation of the principal hysteresis cha-
racteristics with such a treatment. The maximum permea-
bility increases with tension by approximately 30% up to

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RUMANIA/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6253

a tension of 20 kg/mm^2 for wire in the first state.
For wires in the second state, the maximum permeability
increases approximately by a factor of 3 with increasing
stress up to 20 kg/mm^2 . Tension above 20 kg/mm^2 causes
a reduction in the maximum of permeability for both sta-
tes. -- A.V. Zalesskiy

Card 2/2

POLAND/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6258

Author : Markowski Janusz

Inst : Institute of Physics Academy of Sciences, Warsaw

Title : On Desaccommodation Effect in Nickel

Orig Pub : Acta phys. polon., 1959, 18, No 1, 75-79

Abstract : A report is made of the preliminary results on the observation of the time decrease in reversible permeability of nickel, appearing when the compression stresses are increased. The value of the drop is on the order of 1%. It is indicated that the drop in the reversible permeability appears probably also under other conditions, but as a result of the smallness of the effect its measurement is difficult. The observed drop in the reversible permeability is analogous in its nature to the phenomenon

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POLAND/Magnetism. - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6258

of desaccommodation, discovered by Snoek in the forties (Snoek J.S. "Physica", 1939, 6, 161). -- A.V. Zalesskiy

Card 2/2

CZECHOSLOVAKIA/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6264
Author : Tischer Zdineh
Inst : -
Title : Magnetically Soft Materials of Soviet Manufacture
Orig Pub : Shelovaci techn., 1959, 7, No 4, 131-132
Abstract : Survey.

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CZECHOSLOVAKIA/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6266
Author : Hajko Vlademir, Daniel-Szabo Juraj
Inst : Polytechnic Institute, Kosice, Czechoslovakia
Title : Effect of Alternating Magnetic Fields on the Residual
State of Magnetically Soft Materials
Orig Pub : Chekhosl. fiz. zh., 1959, 9, No 1, 37-46
Abstract : An investigation is made of the effect of an alternating magnetic field with different values of the maximum amplitude on the residual state or the apparent residual state of ring-like or unclosed specimens of metallic or non-metallic soft ferromagnets. The interpretation of the corresponding dependences is based on the Kondorskiy representation of the composition of polycrystalline ferromagnetic material.

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CZECHOSLOVAKIA/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6267
Author : Hajko Vladimir, Daniel-Szabo JuraJ
Inst : -
Title : Effect of Alternating Magnetic Field on Residual State
of Magnetically Soft Material.
Orig Pub : Ceskosl. casop. fys., 1959, 9, No 1, 38-46
Abstract : See Abstract 6266.

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CZECHOSLOVAKIA/Magnetism - Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6274
Author : Vavra, J.
Inst : -
Title : Ferromagnetic Oxides of Iron
Orig Pub : Collect. Czechosl. Chem. Commun, 1959, 24, No 3, 657-
662
Abstract : Translated from Chem. listy, 1958, 52, 573.

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EAST GERMANY/Magnetism - Ferrites and Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6303

Author : Kienlin, A. von

Inst : Siemens & Halske AG, Munich, West Germany

Title : Behavior of Individual Stabilized Domain Walls in Cyclic Magnetization

Orig Pub : Z. angew. Phys. 1959, 11, No 3, 118-119

Abstract : An oscillographic method was used to investigate the hysteresis loops of magnetite with cobalt inclusions. Specimens of torodial form were subjected to a special heat treatment, namely soaking in a longitudinal magnetic field of 100 oersteds to obtain a rectangular hysteresis loop, demagnetization in a decreasing alternating field to reduce the number of boundaries, and finally soaking at increased temperature in the absence of a magnetic field

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EAST GERMANY/Magnetism - Ferrites and Ferromagnetism.

F-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6303

to stabilize the positions of the domain boundaries. In cyclic magnetization of these specimens, one observes large irreversible jumps in the domain boundaries, corresponding to large magnetization-reversal volumes, which occur irregularly and independently of each other. Photographs of the oscillograms are given. The connection between the observed phenomenon and analogous phenomena with nickel-copper, nickel, and manganese ferrites, particularly the appearance of diffusion aftereffect on nickel-copper ferrites in alternating fields at audiofrequency, are considered. -- G.S. Krinchik

Card 2/2

POLAND/Electricity - Electronic Resonance.

G-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6340

Author : Skalinski Tadeusz

Inst : The University, Warsaw, Poland

Title : Optical Orientation of Atoms and Its Detection by Means of the Magnetic-Resonance Method

Orig Pub : Postepy fiz., 1958, 9, No 5, 515-542

Abstract : Under conditions of thermodynamic equilibrium, in the absence of external fields (or in the presence of not very strong fields), each of the states corresponding to a definite value of the magnetic quantum number contains an equal number of atoms. If at least one of the Zeeman sublevels is populated by atoms to a considerably greater degree than the remaining levels, then the so-called optical orientation of the atoms takes place. The author

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POLAND/Electricity - Electronic Resonance.

G-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6340

develops a method for realizing optical orientation of the atoms both in the ground and in the excited states, by resonant and cascade excitation of the atoms to a definite Zeeman sublevel with the aid of corresponding polarized light. Various magnetic-resonance installations, in which optical orientations of atoms are observed, are described. The principal formulas are given for the Zeeman levels of the hyperfine structure for the case of both weak and medium constant magnetic fields H_0 . The question of the influence of an admixture of extraneous gases on the optical orientation of the atoms of the investigated vapor or gas is discussed. On the basis of the Kajorana-Brossel formula (Brossel J., Thesis, Paris, 1951, Ann Phys. 1952, 6, 622) for the probability of transition between the Zeeman sublevels of the hyperfine structure (F, m_F) and F, m'_F) realized in a magnetic-resonance installation, the form and the width of the obtained resonance lines is

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6340

determined. This same formula, with the aid of experimental data on the optical orientation of atoms of various isotopes of mercury, is used to calculate the average lifetimes of the atoms in different states. The results of the calculations are compared with the results obtained by the usual optical methods. Cases are considered of observation of many-quantum resonant transitions in oriented atoms of sodium and cesium, and the question of the measurement of the Stark level shifts in these atoms in the case when the field is parallel to the constant magnetic field H_0 in the magnetic-resonance installation, is also discussed. Problems are considered also of the investigation of transition between sublevels of the hyperfine structure, the determination of the moments of nuclei by means of the method developed in the article, and also the use of double resonance for a finite determination of the abovementioned sublevels. -- L.A. Borisoglebskiy.

Card 3/3

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6372

Author : Das, J.N.

Inst : College of Sciences, Raipur, India

Title : The Dielectric and Piezoelectric Behavior of Pyrolusite (Polycrystalline Ore of MnO_2).

Orig Pub : Z. Phys., 1959, 155, No 4, 465-471

Abstract : An investigation was made of the dielectric properties of pyrolusite as a function of the temperature, frequency, and field intensity in the frequency range from 200 cycles to 10 kas. The specimen at high values of dielectric, $\epsilon \approx 10^5$. The function $\epsilon = f(T)$ has a maximum at a value T_{max} of temperature that varies from specimen to specimen. Above this temperature, ϵ diminishes in accordance with the Curie-Weiss law. The value of ϵ diminishes

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6372

exponentially with frequency and increases noticeably with increasing effective voltage. This increase becomes more noticeable as the frequency is decreased. The presence of hysteresis loops was observed. The value of the losses in pyrolusite ($\tan \delta$) also depends noticeably on the temperature, frequency, and applied voltage. The value of $\tan \delta$ has a maximum at 300 -- 700 cycles, indicating the presence of dielectric relaxation in the investigated specimens, analogous in its causes to the relaxation observed earlier by other authors on polycrystalline samples of rutile. A piezo-effect was also observed in the pyrolusite specimens. A static method was used to measure the coefficients of electromechanical coupling, equal to $(2.4 \text{ to } 8.8) \times 10^{-5}$ electrostatic units per dyne. It is also shown that the resonant frequency of a specimen connected in the circuit of a high frequency

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6372

generator depends on the thickness of the specimen. --
K.S. Aleksandrov

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EAST GERMANY/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6378

Author : Calker Jan van, Linde Laurenz van der

Inst : The University, Munster, West Germany

Title : Measurement of the Field of Electrets and Investigation
of the Formation of the Homocharge

Orig Pub : Z. Phys., 1959, 155, No 4, 413-421

Abstract : The electric field produced by an electret was measured,
and the causes of formation of the homocharge were studied.
To solve the first problem, use was made of a miniature
capacitor of 160 micromicrofarad, which was introduced
short circuited into the field, with one electrode grounded.
The field intensity was determined from the charge flowing
in the leads upon opening of the plates. Agreement bet-
ween the experimental results and Swann's formula was found.

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EAST GERMANY/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6378

The task of the second part of the work was to verify the assumption concerning the mechanism of formation of the homocharge, as a result of the transfer of charge to the dielectric from the electrodes, a transfer which becomes possible by the breakdown of the gas gap. For this purpose, one electrode was made in the form of a needle, to facilitate the breakdown. Under these conditions electrets were formed, consisting of mixtures of carnauba wax, beeswax, and rosin. It was found that the charge penetrating into liquid caused it to oscillate, and as a result a honeycomb pattern was formed on the surface after cooling. The electrets displayed a considerable homocharge, which was found to be much greater near the needle-like electrode than on the opposite side. It was possible to form electrets also of paraffin, and these were found charged by the space charge of one polarity. -- V.Kh. Kozlovskiy

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EAST GERMANY/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6379

Author : Calker, J. van, Froklich H.

Inst : The University, Munster, West Germany

Title : Investigation of Electrets Made of Carnauba Wax and the Origin of Their Heterocharges

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 216-224

Abstract : Results are reported on the investigation of electrets made of carnauba wax. Specimens containing 80% carnauba wax and 20% beeswax were polarized in an electric field of 4 kg/cm. The change of the electrode was measured by the method of depolarization. The charge of an electret of carnauba wax varies with temperature in accordance with the law $Q = Q_0 \exp(-W/RT)$, where the activation energy W ranges from 20 to 16 kcal/mole. With increasing time

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EAST GERMANY/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6379

of polarization of the electret, its charge increases, reaching saturation after 15 hours, if the polarization is carried out at a temperature of 64° C. The polarization current, as a function of the temperature, behaves like the charge up to 30° after which it increases sharply with diminishing temperature. The results of the experiment are in satisfactory agreement with the theory of occurrence of the heterocharge of the electrode, based on the notions concerning the space charge (McDonald and Ross, Physical Review, 1953, 92, 4). -- V.V. Krasnopevtsev

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EAST GERMANY/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6381

Author : Hacke Jurgen

Inst : The University, Giessen, West Germany

Title : Effect of X-rays on the Ionic Conductivity of NaCl.

Orig Pub : Z. Phys., 1959, 155, No 5, 628-635

Abstract : Using an ac Wheatstone bridge, the author determined the electric conductivity (σ) of single crystals of NaCl at temperatures 180 -- 650° C. The dependence of $\log \sigma$ on $1/T$ consists of three straight lines with kinks at 550 and 300° C and activation energies 41.5, 16.9, and 22.8 kcal/mole, reckoning from the higher temperatures. The first two lines pertain to the intrinsic conductivity, the third to the impurity conductivity. The crystals were exposed to x-rays at different temperatures with

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EAST GERMANY/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6381

subsequent measurements of σ at the same temperatures. After irradiation, σ first diminishes, and then again increases. The equilibrium value of σ is found to be less than the initial value. The lower the temperature of the experiment, the stronger the effect. The lines $\log \sigma = f(1/T)$ for the irradiated specimen are lower than prior to irradiation, particularly in the region of impurity conductivity. In the case of x-ray irradiation new vacancies are formed. The previously existing cation vacancies combined into complexes, and consequently σ decreases.
-- P. Meyklyar

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RUMANIA/Electronics - Dielectrics.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6400
Author : Stanomir D.
Inst :
Title : Ferroelectric Phenomena in Barium Titanate and Other Materials
Orig Pub : Telecommunicatii, 1959, 3, No 2, 72-77
Abstract : Survey of ferroelectricity and its technical applications. The presently known ferroelectrics are described.

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EAST GERMANY/Electronics - Semiconductors.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6421
Author : Dorendorf Heinz
Inst : Siemens & Halske, Munich, West Germany
Title : Investigation of p-n junctions in Germanium with Different Density of Recombination Centers.
Orig Pub : Z. Angew. Phys., 1959, 11, No 5, 162-164
Abstract : Nickel in concentrations N_t up to $3 \times 10^{14} \text{ cm}^{-3}$ was introduced into germanium specimens, containing p-n junctions (obtained by alloying during drawing). Nickel was introduced by diffusion. The properties of such junctions, namely the lifetime τ , the barrier current I_s , and the photocurrent I_L were investigated as a function of N_t . The results were compared with the calculated values given by Clark for conductivity-damping processes. The lifetime on the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6421

p-n junctions was measured by two methods: that of Kingston (Referat Zhur Fizika 1955, No 9, 19700), and that of Lederhandler and Gigoletto (Referat Zhur Fizika 1956, No 3, 7675). The calculated and experimental dependences of τ_n and τ_p on N_t are shown graphically. At small N_t , the experimental data are found to be considerably lower than the theoretical ones, and this is associated with the surface recombination and the presence of recombination centers of unknown origin. In the regions of large N_t , the data of the two methods differ somewhat. However, the most interesting is the fact that the measured values of τ follow the curve of τ_p , and not of τ_n , as would be expected in the measurement of the temporal damping process. This unexpected result is explained by the peculiarities of the measurement methods. The barrier current I_s has saturation even at large N_t . This means that in spite of the high N_t , the unsaturated recombination

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6421

current is small compared with the diffusion current. The value of I_s increases in accordance with the calculation, but the experimental curve is shifted upward by a constant quantity, this being associated with the surface currents. In accordance with theory, I_L is proportional to the diffusion length at constant illumination.
-- V.V. Ostroborodova

Card 3/3

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6422

Author : Majewski, Z., Sikorski, S., Swiderski, J.

Inst : -

Title : On the Relation Between Anomalous Resistivity and Concentration Gradient of Carriers in Germanium

Orig Pub : Bull. Acad. polon. sci. Ser. sci. techn., 1959, 7, No 6, 401-406

Abstract : In the measurements of the specific electric resistivity of Ge by the two-probe method, the results are considerably higher than the specific resistivity of pure Ge. These anomalous values of the resistance depend on the voltage and on the direction of the current used in the measurements. It has been noted that this phenomenon is accompanied by the appearance of a volume photo-emf the behavior of which is connected with a character of the nonlinearity of the specific electric resistivity, and it

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6422

cannot be explained with the aid of the Lashkarev-Romanov theory (Referat Zhur Fizika 1957, No 3, 7045) or the Tautz theory (Referat Zhur Fizika 1955, No 11, 24903). Investigations have been made, indicating the appearance of injection of minority carriers from one portion of the inhomogeneous specimen of germanium to another. An hypothesis is advanced that this is the essential reason for the occurrence of anomalous values of resistance. The application of measurements of the photo-emf for simple identification of the sections of anomalous resistance is proposed.

Card 2/2

EAST GERMANY/Electronics - Semiconductors.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6432

Author : Henniger, H., Hultschig, H., Heratsch, G.

Inst : VEB Plant for Construction Elements for the Communication Engineering "Carl van Ossietzky" Berlin

Title : On the Dependence of the Specific Resistivity of Ferrites on the Pressing Pressure.

Orig Pub : Exptl. Tech. Phys., 1959, 7, No 2, 90-91

Abstract : An investigation was made of the influence of pressing pressure on the specific electric resistivity of Ni-Zn ferrites at 20° C. Previously sintered and then subsequently powdered material was subjected to pressing. As the pressure was increased from 100 to 500 kg/cm³, the resistance of the ferrite increased linearly from $\sim 10^5$ to 10^3 ohm-cm. -- Ye.G. Ponyatovskiy

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CZECHOSLOVAKIA/Electronics - Semiconductors.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6434

Author : Koseh, F., Horak, J., Kaspar, J.

Inst : Technical or Chemical College, Pardubice, Czechoslovakia

Title : Conductivity of Copper Tungstate

Orig Pub : Collect. Czechsl. Chem. Commun., 1959, 24, No 6, 2034-2037

Abstract : Sintered specimens of CuWO₄ were used to investigate the dependence of the conductivity on the temperature. From this dependence, the energy of activation was calculated; on the basis of the analysis of the lines and the Debye patterns of certain conducting specimens of CuWO₄, the strength of the Cu -- O -- W bond is evaluated.

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EAST GERMANY/Electronics - Semiconductors.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6436

Author : Adirowitseh, E.I.

Inst : -

Title : Correction to the Article "Effect of Internal Emission on the Distribution of a Strong Field in a Solid"

Orig Pub : Z. Phys., 1959, 155, No 5, 635

Abstract : Refers to Referat Zhur Fizika 1960, No 1, 1369.

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POLAND/Electronics - Semiconductors.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6452

Author : Rohleder Jozef

Inst : Physical Chemistry Faculty, Polytechnic, Wroclaw, Poland

Title : Further Investigations of the External Photoeffect in KCl Crystal, Containing Centers of Metallic Thallium (KCl, Tl)

Orig Pub : Roczn, Chem., 1959, 33, No 2, 411-418

Abstract : From the sign of the thermal emf, it was determined that the current carriers in crystals KCl, Tl are holes. In the volt-ampere characteristics of the photocurrent, up to gradients of 2×10^4 v/cm, there is no saturation and one can therefore assume that the charge is $Q = NeE/d$, where N is the concentration of the current carriers, e the carrier charge, E the intensity of the field, WE the average shift, and d the distance between electrodes. Using

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6452

this formula, it is possible to determine the product Nw . Assuming the w is the same as for the electrons in crystals with F centers and (according to Pohl's data) its value is $10^{-7} - 10^{-8} \text{ mm}^2/\text{v}$, we obtain $N = 10^{12}$ to 10^{13} cm^{-3} , which is 10^6 to 10^5 times smaller than the concentration of ~~TL~~ TL. Experiment shows also that the current density (meaning also Nw) is almost independent of the concentration of Tl. It is concluded therefore that as the concentration is increased N increases and w decreases. The latter may be connected with the fact that some of the Tl atoms play the part of traps. -- A. Shneyder

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6453

Author : Rohleder Jozef

Inst : Physicsl Chemistry Faculty, Polytechnic, Wroclaw, Poland

Title : Band Model of KCl Crystals, Containing Centers of Metallic Thallium (KCl, Tl).

Orig Pub : Roczn, chem., 1959, 33, No 2, 419-427

Abstract : It is proposed that in the KCl lattice one should distinguish between two position of Tl atoms: 1) Tl atoms around which are located vacant anion sites; 2) Tl atoms, near which there are no corresponding vacant sites. The former have an acceptor character, and are responsible for the photoconductivity. The concentration is on the order of $10^{13} - 10^{14} \text{ cm}^{-3}$ and they are located 2.26 eV above the edge of the valence band. The other levels are

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6453

located 5.5 ev below the conduction band and are responsible for optical absorption. Upon absorption of light with $h\nu \approx 4.0$ ev, only excitation of the centers takes place and there is no photoconductivity. Upon absorption of light with $h\nu 5.2$ ev, weak photoconductivity is produced, possibly due to the presence of thermal effects. -- A. Shneyder

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6462

Author : Trlifaj Miroslav

Inst : Physics Institute, Czechoslovak Academy of Sciences,
Prague

Title : Theory of Exciton Annihilation Accompanied by the Occurrence of Defects of a New Type and of Current Carriers.

Orig Pub : Chekhosl. fiz. zh., 1959, 9, No 4, 446-459

Abstract : An investigation was made of the process of annihilation of excitons on vacancies and F-centers in ionic crystals. The annihilations are accompanied by the occurrence of a new type of center and of current carriers. General expressions are derived and evaluated for the corresponding effective cross sections in the quasi-classical approximation.

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RUMANIA/Electronics - Substances with Metallic Conduction.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6470

Author : Corciovei, A.

Inst : -

Title : Effect of the Order on the Electric Resistivity of Binary Alloys.

Orig Pub : Studii si cercetari fiz., 1959, 10, No 1, 117-131

Abstract : A study is made of the effect of ordering phenomena on the specific resistivity of binary alloys with almost equal concentrations of components, upon approach to complete ordering (Referat Zhur Fizika 1959, No 12, 27784). In the investigation, one begins with a potential difference from the Nordheim potential (Nordheim L. Ann. Phys. Lpz. (5), 1931, 9, 607). The Mathiessen rule is discussed and it is indicated that actually the more correct one is the Kohler inequality (Kohler K., Z. Phys. 1949, 126, 495). In the discussion of the consequences

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RUMANIA/Electronics - Substances with Metallic Conduction.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6470

of ordering at low temperatures, certain already known results have been confirmed (Dienes G., Journal of Applied Physics, 1951, 22, 1020), and several qualitative remarks are made for temperatures close to the Curie temperature.

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RUMANIA/Radio Physics - General Problems.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6481

Author : Draganessu Minai, Stancu Gheorghe

Inst : -

Title : Proposals Concerning Terminology of Electronic Devices

Orig Pub : Automat. si electron., 1959, 3, No 2, 76-80

Abstract : The terminology project was proposed by the authors at the Conference on Communication Problems, held at Bucharest Polytechnic Institute on 18 -- 19 October 1958. It is based on the following classification of electronic devices. 1. Electronic tubes. A, Vacuum tubes. 1. Ordinary tubes (diodes, triodes, tetrodes, etc). 2. Electron beam tubes. a) Cathode rays tubes (oscilloscopes and oscillographs, electronic switches, tubes with charge storage, etc.). b) Transmitting television tubes (iconoscope, orthicon, vidicon, etc.). c) Generator microwave tubes (electrostatic -- klystron, reflex

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RUMANIA/Radio Physics - General Problems.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6481

klystron, traveling wave tube, backward wave tube, etc.). 3. Magnetrons (diode, with slotted anode, with resonant cavities etc.). B. Gas filled tubes. 1. Glow discharge (indicator, stroboscopic, stabilizers, thyratrons with cold cathode, etc.). b) With mercury cathode (mercury arc rectifiers, ignitrons, etc.). c) Counters (Geiger-Muller, proportional, etc.). C. Photoelectric devices (vacuum photocells, gas-filled photocells, photomultipliers, electro-optical converters). II. Semiconductor devices. i. Diodes (point-contact, junction, etc., selenium rectifiers, Cu_2O rectifiers). 2, Transistors (triodes, tetrodes, spacistors, etc. 3. Photocells (photoresistances, photodiodes, phototriodes). 4. Varistors (thermistors, etc.). 5. Detectors. III. Devices based on superconductivity -- cryotron. Bibliography, 28 titles.

Card 2/2

RUMANIA/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6484

Author : Comsa George

Inst : -

Title : Variation of the Work Function of Nickel with Temperature

Orig Pub : Studii si cervetari fiz., 1959, 10, No 1, 163-171

Abstract : Using the method of shifting the characteristics, the temperature coefficient of the work function of nickel was determined in the temperature range from 720 to 1025° K. It was found that this coefficient is $(-2.65 \pm 0.03) \times 10^{-5}$ ev/deg. Analysing the effect of the residual gases and the results of the measurements, the author reaches the conclusion that at the given experimental conditions (pressure 1.2×10^{-9} mm mercury) they introduce practically no errors in the measurement data.

Card 1/1

RUMANIA/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6485

Author : Comsa George

Inst : -

Title : On the Value of the Temperature Coefficient of the Work Function, Determined on Polycrystalline Surface of Nickel.

Orig Pub : Studii si cercetari fiz., 1959, 10, No 1, 145-162

Abstract : An analysis is made of the significance of the results obtained by employing the method of the shift of the characteristics to determine the temperature coefficient of the work function of a polycrystalline surface of nickel. Two problems were investigated: 1. Effect of the "spot field" on the electron currents from different phases of the crystallites of polycrystalline surfaces. 2. The effect of the temperature coefficient of the work function of different phases of the crystallites on the measured temperature coefficient. Bibliography, 12 titles.

Card 1/1

RUMANIA/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6486

Author : Iosifescu, B.

Inst : -

Title : Temperature Variation of the Work Function of Molybdenum

Orig Pub : Studii si cercetari fiz., 1959, 10, No 1, 177-186

Abstract : An experimental investigation was made of the electron emission of polycrystalline molybdenum at temperatures 700 -- 1100° K. This investigation has made it possible to establish that the temperature coefficient of the work function equals in this case $(7.86 \pm 0.04) \times 10^{-5}$ ev/deg. It is noted that the measurement accuracy obtained in this work is two orders of magnitude higher than in preceding investigations by other authors.

Card 1/1

POLAND/Radio Physics - Electronics and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6488

Author : Lewenstein Krystyn

Inst : -

Title : Processing and Investigation of a Thorium-Oxide Cathode

Orig Pub : Zesz. naue. Politechn. warsz., 1958, No 38, 71-103

Abstract : The author describes the technology and the properties of thorium-oxide cathodes. Also described are the methods of preparation of the direct-heated cathode W-ThO₂-Th and methods of investigation of the emission properties of these cathodes. Results of the investigations are reported. Bibliography, 37 titles.

Card 1/1

EAST GERMANY/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6497

Author : Brinkmann, E., Deichsel, H.

Inst : Physics Institute, University, Mainz, West Germany

Title : On the Additivity of the Photocurrent and the Secondary Electron Emission Current.

Orig Pub : Z. Phys., 1959, 156, No 2, 159-162

Abstract : In 1925, Dember (Dember H.Z. Phys. 1925, 33, 529) observed that there is no additivity of the photocurrent in the secondary electron emission current from aluminum, exposed to light and bombarded by electrons (for example, photocurrent in the presence of simultaneous electron bombardment could increase by approximately 150 times the photocurrent in its absence). In 1956, Eckertova (Referat Zhur fizika 1957, No 4, 9770) established the absence of this

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EAST GERMANY/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6497

effect (the so-called Dember effect) in aluminum and magnesium, both in the form of pure metallic films (obtained by evaporation in vacuum), and upon their weak oxidation. The authors of the present paper have repeated Dember's measurements under experimental conditions as close as possible to the original ones, under two different modes, close to that of Dember, and close to that of Eckertova. This verification has shown that in the case of pure metallic surfaces, the additivity is not violated, whereas for an oxidized surface, the Dember condition gives absence of additivity, while the Eckertova condition gives the presence of additivity. Since in Dember's experiments the surface of aluminum, as indicated by the authors, was undoubtedly oxidized (bulk aluminum), one must assume that the "Dember effect" exists for oxidized aluminum. A direct reason for this is considered by the authors to be the internal photoeffect in the Al_2O_3 film,

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EAST GERMANY/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6497

which increases its longitudinal conductivity. The presence of such an increase under the influence of light was demonstrated by the authors by direct experiments on a free film of Al_2O_3 .

Card 3/3

RUMANIA/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6502

Author : Badarau, E., Petrescu Paul

Inst : -

Title : Phenomenon of Exoelectronic Emission.

Orig Pub : Studii si cercetari fiz., 1959, 10, No 1, 187-192

Abstract : Survey article. Bibliography, 25 titles.

Card 1/1

CZECHOSLOVAKIA/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6503

Author : Sujah Bogdan

Inst : Institute of Physics, Polish Academy of Sciences,
Institute of Experimental Physics of the Bierut
University, Wroclaw, Poland

Title : Parent Exoelectronic Emission, Caused by Liberation of
Water of Crystallization with Increasing Temperature.

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 5, 616-617

Abstract : In some cases, when using open counters, the liberation
of the water of crystallization upon heating of the salt
is accompanied by an increase in the counting rate, which
can be mistaken for exoelectronic emission. In a similar
manner, when working with counters in the region of the
so-called prolonged discharge (at increased voltage),

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CZECHOSLOVAKIA/Radio Physics - Electronic and Ionic Emission.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6503

they register only α particles and water vapors, and not
electrons and ions. For this latter case, the author
gives the dependence of the counting rate on the tempera-
ture in heating of cuprous oxide, and this dependence dis-
plays three maxima corresponding to a jump-like dehydra-
tion of the cuprous oxide.

Bibliography, 9 titles.

Card 2/2

CZECHOSLOVAKIA/Radio Physics - Corpuscular Optics

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6510
Author : Rezanka Ivan
Inst : -
Title : Stray Fields of Conical Pole Pieces
Orig Pub : Chekhosl. fiz. zh., 1959, 9, No 2, 266-268

Abstract : The author calculates the stray field of conical pole pieces, intended for the production of an inhomogeneous sector magnetic field, which varies in the meridian plane in inverse proportion to the distance from the axis of the field. Assuming that the pole pieces are not bounded in the radial direction and that their surfaces are equipotential, and also assuming that the air gap between them is small, the author reduces the problem of finding the stray field to the solution of the plane problem, obtained by Coggeshall (Coggeshall N.D., Journal of Applied Physics, 1947, 18, 855). -- V.A. Bazakutsa

Card 1/1

EAST GERMANY/Radio Physics - Electronic Microscopy.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6523
Author : Buhl, R.
Inst : The University, Tubingen, West Germany
Title : Interference Microscopy with Electron Waves
Orig Pub : Z. Phys., 1959, 155, No 4, 395-412

Abstract : The author describes the fundamental principles of construction of an electronic interference microscope using an electronic biprism, previously described by Mullenstadt and his coworkers (Referat Zhur Fizika 1955, No 9, 19595; 1956, No 7, 20269; 1957, No 5, 12304). Two possible schemes are considered for the path of the electron beams: with a biprism located between the object and the objective, and the biprism located behind the objective. The brightnesses of the interference pattern in both cases are

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6523

compared. The former scheme was selected for the experiments. A brief description of the instrument is given. The objective and projective used are electrostatic lenses, which make it possible to obtain a resolution better than 100 Å (working voltage 50 kv). The biprism consists of a thin metallized quartz thread (thickness < 1 micron), located between two electrodes. Electron images of the edge of a carbon film in crystals MgO, shaded with gold and aluminum, were obtained, with superimposed interference patterns. The shift of the interference fringes on the boundaries of the objects makes it possible to phase shifts of the electron beams and from them, the internal potentials of the crystals. This method was used to determine the average internal potentials of gold, silver, aluminum, zinc sulfide, etc. Bibliography, 19 titles. -- V.I. Milyutin

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6537

Author : Draganescu, M.

Inst : -

Title : Dependence of the Amplification Factor of a Triode on Its Operating Condition

Orig Pub : Bul. Inst. politehn. Bucuresti, 1956, 18, No 3-4, 317-325

Abstract : As is known, the amplification factor of a triode depends on its operating condition, but this dependence is less important than the change of its two other parameters (the internal resistance and the transconductance) with changing operating conditions. A previously derived expression (Referat Zhur Fizika 1957, No 10, 25894) for the amplification factor of the triode, is given, in the form $\mu = 1/p - qU_g/U_a$ (where $p > q$, $q < 0$, and $U_g < 0$). The change in μ is due to the presence of space charge between the electrodes and inhomogeneity of the electric

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RUMANIA/Radio Physics - Propagation of Radio Waves.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6537

field on the cathode. In the present work, the author investigated the effect of the phenomenon of the return of the electrons from the grid on the value of the amplification factor of the triode. Formulas are given for the plate current and for the amplification of the triode, taking this phenomenon into account.

Card 2/2

CZECHOSLOVAKIA/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6546

Author : Kracih Jiri

Inst : -

Title : Effective Surge Impedance of a Low Pressure Discharge

Orig Pub : Slaboproudý obzor, 1959, 20, No 4, 217-222

Abstract : The investigated discharge was connected in parallel with a complex impedance and in series with another complex impedance. The equations that describe the phenomena in the plasma discharge are linearized and used to determine the impedance of the plasma. The impedance is a function of the frequency of the current flowing, of the variation of the applied voltage, and of quantities that describe the equilibrium state of the plasma and the parameters of the external circuit.

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6561

Author : Hettner, G., Wagner, H.

Inst : Institute of Theoretical Physics, Technical College,
Munich, West Germany

Title : Fourier Analysis of Electric Microfields in a Plasma. I.

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 89-95

Abstract : The probability distribution of the amplitudes of the local electric field in a plasma is calculated with the aid of the Fourier integral transformation. The integrals involved in the calculations are found to be divergent. To eliminate the divergences, three essentially cutoff parameters are introduced. Upon integration over the distance, the upper limit is taken to be the Debye radius, although this does not agree with the formulation of the problem,

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6561

since the calculations do not take into account the interaction between the charged particles. At small distances, one excludes from the region of integration a spherical volume, the arbitrary radius of which, s , serves as the lower limit of integration and defines the upper boundary of the spectrum. All this is still not enough to eliminate the divergences. One therefore introduces the condition that the phases of all the electrons should be included within an arbitrary finite time interval T . If T goes to infinity, the results lose their meaning. The final probability distribution obtained for the fluctuations of the field amplitudes is expressed by the Gauss formula. The parameter entering into this formula is found to be proportional to the arbitrary time interval T . It is proposed to assume for T the duration of the considered physical process. The results depends also on the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6561

cutoff radius s , the meaning of which is not explained at all, but it is stated that this dependence is weak.
-- D.A. Frank-Kamenetskiy

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RUMANIA/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6567

Author : Chulli, S., Miky, M.

Inst : -

Title : Plasma Oscillations in an External Static Magnetic Field

Orig Pub : Rev. phys. Acad. RPR, 1958, 3, No 3-4, 211-218

Abstract : Using the Boltzmann kinetic equation, the authors investigate the function of static charge distribution in the gas, and also small derivations from this distribution. The stationary solution is considered for a cylindrical symmetrical plasma. It is proposed that the deviation from the stationarity is due only to the electrons. In this case it is possible to separate the variables, and this leads to a Maxwellian velocity distribution and to a spatial part, which varies at large distances as $1/r^4$. In view of the assumed smallness of the deviation from the equilibrium position, the disturbances of the plasma are

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RUMANIA/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6567

taken into account only in the deviations of first-order moments (from Maxwellian distribution), while higher-order moments are approximated by moments calculated with the aid of the Maxwellian distribution of the stationary state. The equations are linearized, and a system of differential equations is obtained for the Fourier components of the magnetic field, the asymptotic form of the solutions of which is investigated. The dispersion relations are obtained by reconciling this asymptotic solution with the regular solution at the origin,. -- Ye.Ya. Lantsburg

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6576

Author : Wojaczech, K.

Inst : Physical-Technical Institute, German Academy of Sciences, Research Community, Berlin

Title : Calculation of the Growth of the Number of Layers in the Diffusion Theory of Running Striations

Orig Pub : Monatsber. Dtsch. Akad. Wiss. Berlin, 1959, 1, No 1, 23-26

Abstract : An experimental investigation of the running striations in a discharge in argon at low pressure has shown that the frequency of oscillations in these striations is closely connected with the increase in the number of layers. This experimental fact is not taken into account in the theory, since all the calculations are produced for real

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6576

(and not complex) values of the wave number. In the case of running layers, their length (along the tube) should diminish slowly with increasing frequency of the oscillation, and the number of striations increases monotonically. However, experiments show that under identical discharge conditions, the length of each layer increases with increasing oscillation frequency, and the number of layers goes through a maximum, the position of this maximum also depending on the frequency of the oscillations in the striations. Theory and experiment contradict each other at this point. Elementary calculations of the number of newly produced charge carriers, in which a count is taken of the possibility of step-like ionization, make it possible to obtain for the limiting case the length of each individual striation. The calculated values correspond approximately to the values obtained from experiment. However, the contradiction between the experiment and

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6576

theory is not completely eliminated, and the diffusion theory of running striations requires further development.
-- N.A. Kaptsov

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CZECHOSLOVAKIA/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6580

Author : Hollander Egon Felix

Inst : Welding Research Institute, Bratislava, Czechoslovakia

Title : Application of the Thermodynamics of Irreversible Processes to the Welding Arc

Orig Pub : Ceskosl. casop, fys., 1959, 9, No 1, 66-73

Abstract : On the basis of the equations of thermodynamics, an attempt is made to explain quantitatively the process of self-adjustment of the welding arc. The theory is employed for the case of a linear arc characteristic, followed by consideration of the steady-state arc, and finally, a general derivation is given for an equation which determines the automatic regulation of the arc. From this conclusion it is seen that all the properties of the

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CZECHOSLOVAKIA/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6580

welding arc, contributing to its automatic regulation, follow naturally from thermodynamic laws. Each given mode of arc can be reached by changing one external parameter, for example the power of the current source, the current the rate of motion of the electrode, or its rate of melting.

Bibliography, 12 titles. -- N.A. Kaptsov

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POLAND/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6585

Author : Bader, J.

Inst : Faculty of High Voltages, Polytechnic, Warsaw

Title : Experimental Investigation of the Post-Arc Resistance of Small Spark Gaps

Orig Pub : Arch. elektrotechniki, 1959, 8, No 1, 133-155

Abstract : A circuit is described for measuring the post-arc resistance of small spark gaps. This circuit was used to measure the post-arc resistances from 0.3 to 1.8 mm at pulsed currents of 0.1 -- 4 kiloamperes and at accompanying currents of 50 -- 560 amperes.

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CZECHOSLOVAKIA/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6595

Author : Hermoch Vladimir

Inst : Institute of Technical Physics, Czechoslovak Academy of Sciences, Prague

Title : Channel of Pulsed High-Current Electric Discharge

Orig Pub : Ceskosl. casop. fys., 1959, 9, No 2, 141-149

Abstract : An investigation was made of the development of a channel of pulsed high-current discharges (duration 100 microseconds, maximum current up to 10,000 amperes) as a function of the current strength, the distance between electrodes, and the material of the electrodes with simultaneous measurement of the electric parameters (voltage across the discharge gap, voltage gradient). An analysis of the results of the measurements of the electric conductivity of the

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CZECHOSLOVAKIA/Radio Physics - Radio Frequency Measurements.

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6595

plasma (copper electrodes) shows that during the discharge process there is a change in the temperature and pressure of the plasma. The compression of the channel depends to a considerable degree on the evaporation of the electrodes and on their heat conduction. The relative influence of these factors changes with distance from the electrodes, i.e., the degree of compression of the channel depends on this distance. The evaporation of the electrodes is periodic in nature. The radial components of the velocities depend on the rate of evaporation. The intense glow of the vapors (for easily-melting elements) did not make it possible to observe the shape of the channel. Bibliography, 20 titles. -- S.F. Shushurin

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6612

Author : Neumann Werner, Peters Arnold, Rademacher Karl, Rompe Robert

Inst : German Academy of Sciences, Berlin, Physical Technical Institute, Division of Radiation Sources.

Title : Description of a Setup for Obtaining a Plasma Beam in Argon with Indestructible Electrodes and Determination of the Distribution of Temperature in the Plasma Beam.

Orig Pub : Exptl. Techn. Phys., 1959, 7, No 2, 77-84

Abstract : The use of a high temperature electric arc for technical purposes is made difficult, since the streamer of such an arc contracts at the anode into a spot of small diameter, and the anode is rapidly destroyed. This obstacle is eliminated by using the so-called plasma beam, in which a

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6612

gas in the state of a high temperature plasma, is blown at high velocity (the Mach number reaches several units) through a more or less narrow channel in the anode of the arc. Results are given, obtained up to now in the investigation of a plasma beam penetrating through an opening in a copper anode of a strong current (up to 427 ampere) arc in argon, with 500 liters of argon being blown through this opening per hour. Behind the anode is placed a special furnace, in which the plasma beam is used to melt refractory substances. To investigate the distribution of the temperature in the plasma beam, the furnace was removed and the beam was photographed through a metallic interference filter ($\lambda = 5560 \text{ \AA}$, half width of the transmitted portion 100 \AA). To obtain blackening marks on the photo-emulsion, and for absolute measurements of the radiation intensity, the same apparatus was used to photograph, through gray light filters of different transmission, the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6612

center portion of the arc of a xenon lamp of superhigh pressure XF3,000, the radiation temperature of which was established, in turn, by comparison with a black-body radiation. The photographs of the spectrum of the plasma arc in the region from 4100 to 7500 \AA were made by a three-prism glass spectrograph with an average dispersion of 15 amperes per millimeter. The strength of the discharge current was established with the aid of resistances, cooled with running water, the length of the section of the plasma beam with a temperature of 9,000° K and above (Judging from the distance from the point at which the temperature was measured to the axis of the beam) was found to be 15 mm. Observation with the unprotected eye made it possible to see the continuation of the plasma beam with a lower temperature, up to 30 cm. The power dissipated in the beam was determined calorimetrically. A tungsten wire 2 mm in diameter was melted

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EAST GERMANY/Radio Physics - Radio Frequency Measurements.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6612

under the conditions of the experiments described only in individual drops, which were transformed into balls 3 mm in diameter. -- N.A. Kaptsov

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POLAND/Radio Physics - Radioastronomy

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6617

Author : Mroziewicz, B.

Inst : Institute of Fundamental Engineering Problems, Polish Academy of Sciences.

Title : Technology of Fused p-n Junctions from the Point of View of Their Form

Orig Pub : Arch. elektrotechniki, 1959, 8, No 1, 169-200

Abstract : The author considers the influence of the shape of p-n junction on the value of the limiting frequency and the current gain of transistors, prepared by the fussion method. It is shown that the necessary condition for attaining high values of the foregoing parameters is the production of plane p-n junctions. A brief description is given of the production of p-n junctions by the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6617

method of fussion with separation into three stages: milting, fussion, and recrystallization. It is noted that the form of the junctions obtained is closely related with the wetting of the germanium by the fused metal and with the rate of fussion of the latter. In addition, it depends on the depth of the junction and on the orientation of the plane of the plate relative to the crystallographic axis. The question of the wetting is considered from the physical point of view. The wetting can be good, if one insures suitable purity of the contacting surfaces. The oxides are particularly harmful in this case. To eliminate these oxides, the fussion process is effected in an atmosphere of hydrogen or in the presence of a flux around the surfaces in contact. The wetting can also be improved by introducing into the indium a small amount of a metal that reduces its surface-layer energy. The fusion process develops properly in that case, when it proceeds

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6617

sufficiently slowly. Such a condition can be attained by increasing the temperature slowly, or by introducing into the indium a metal which makes the melting of the germanium difficult. Experiments have shown that addition of lead facilitates considerably the preparation of flat p-n junctions. Also considered is the influence of the orientation of the pane of the germanium plate on the form of the junction, and it is shown that the most suitable plane for production of flat junction is the 111 plane. It is shown that the attainable geometry of the junction is the flatter, the closer the junction is to the surface. The depth of penetration can be regulated by selecting the process temperature or the volume of the metal which is fused in. The experiments performed are described and methods are given for observing the p-n junctions. Bibliography, 24 titles.

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EAST GERMANY/Radio Physics - Radioastronomy.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6640
Author : Wienhold, H., Ohm, M.
Inst : VEB Vakutronik, East Germany
Title : Stabilization of the Gain of Secondary-Electron Multipliers
in Scintillation Counters.
Orig Pub : Kernenergie, 1959, 2, No 4, 325-328
Abstract : A scheme is described for stabilizing the gain of secondary-electron multipliers in supply-voltage fluctuations, based on suitable changes in the voltages on one of the dynodes, the use of which makes it possible to reduce the requirements concerning stabilization of the high voltage by a factor of 10. -- A.M. Kharchenko

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CZECHOSLOVAKIA/Radio Physics - Application of Radiophysical Methods. I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6647
Author : Paty Libor, Neuzilova Radmila
Inst : Charles University, Prague Czechoslovakia
Title : A New Construction of High-Vacuum High-Speed Pump.
Orig Pub : Ceskosl. casop. fys., 1958, 8, No 6, 740-742
Abstract : The diagram of the pump is given along with the results of an investigation of its operation. Pumping begins at a pressure 1×10^{-2} mm mercury. The rate of pumping increased to a maximum of 18 liters per second at a pressure of approximately 10^{-5} mm mercury. When disconnected from the forevacuum for a short time, pumping continued through the adsorption effect in the cathode space. It is established that the fraction of adsorption is predominant at high pressures and at large magnetic fields.

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CZECHOSLOVAKIA/Radio Physics - Applications of radiophysical methods. I

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6647

At pressures less than 4×10^{-4} mm mercury the pumps operate on the basis of transport processes and ion recombination processes. -- V.G. Zheravov

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CZECHOSLOVAKIA/Radio Physics - Application of Radiophysical Methods. I

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6648

Author : Paty Libor, Neuzilova Radmila

Inst : -

Title : A New Construction of a High Vacuum High Speed Ion Pump

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 6, 746-747

Abstract : See Abstract 6647.

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POLAND/Radio Physics - Application of Radiophysical Methods.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6649

Author : Kiliszek, C.

Inst : -

Title : Absorption of Gases by Means of NiBa Gas Absorbers.

Orig Pub : Elektronika, 1957, 3, No 12, 55-56

Abstract : The absorbing ability (efficiency) of a gas absorber is expressed by the amount of absorbed gas per unit mass of absorption. The efficiency is not constant even from absorbers of the same type, but from a different source. One of the factors that determine the properties of a layer of gas absorber is the amount of gases liberated during the time of pulverization. In this investigation, a study was made of the connection between the pressure of the gases liberated during pulverization of the gas absorber and the efficiency of samples of NiBa gas absorber, obtained from three different sources.

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POLAND/Radio Physics - Application of Radiophysical Methods.

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6649

From the data one can conclude that the absorber that liberates a small amount of gas during pulverization does not have high efficiency.

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POLAND/Radio Physics - Application of Radiophysical Methods.

I-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6656

Author : Kalinski Jerzy

Inst : -

Title : Electronic Apparatus for the Measurement of Weak Intensities of Infrared Radiation

Orig Pub : Zesz. nauk. Politechn. warsz., 1958, No 38, 33-70

Abstract : Description of an electronic device for the measurement of infrared radiation from stars, based on the application of photo-resistances, sensitive to the infrared, as radiation detectors.
Bibliography, 38 titles.

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BULGARIA/Acoustics - Noise.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6717

Author : Raev, A., Popova, L.

Inst : Institute of Physics, Sofia University, Bulgaria

Title : On the Voltage-Tunable Operation of Magnetrons with Resistive External Circuit.

Orig Pub : Dokl. Bolg. AW, 1958, 11, No 6, 441-444

Abstract : An investigation was made of the dependence of the active component of the alternating voltage between segments of a slotted magnetron V_a on the resistance and capacitance of the external circuit. A simple calculation shows that the quantity V_a depends on $R' = R/(1 + \omega^2 C^2 D^2)$, where R is the resistance of the external circuit, C the capacitance between the segments, and ω the circular frequency of oscillations. The experiments were carried out on

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 6717

three two-segment Phillips type TAM1.5/50L magnetrons with anode radius 0.5 cm and cylinder height 2 cm. It was established that in the generating mode the anode current is almost proportional to V_a . The results of the experiment demonstrate that I_a (meaning also V_a) depends on R and C through R' , which confirms the initial premises. Simultaneously, the variation of the curve $I_f(V_a)$ which characterizes the dependence of the space charge density of the spoke on the voltage maintaining it. It is noted that the space charge density of the spoke reaches a certain limit with increasing V_a . The results obtained confirm the hypothesis that a self-maintaining electron spoke is produced in the magnetron. -- E.Ya. Pastron

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6739

Author : Breitenhuber, L.

Inst : -

Title : On the Radiation of a Circular Wave Guide which is Inclined Relative to a Metal Screen

Orig Pub : Z. Phys., 1959, 155, No 4, 441-452

Abstract : The problem is considered of the radiation from a round wave guide, provided on the end with an infinite plane metallic flange, and the direction of the normal to the flange makes an arbitrary angle α with the longitudinal axis of the wave guide. The intensity of the electric field in the far zone is written with the aid of a formula which is a vector analogue of the Huygens principle, in terms of the integral over the surface of the radiating opening of an expression, which includes the distribution function of the electric field in the output

Card 1/3

EAST GERMANY/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6739

aperture and a factor that takes delay into account. In calculating this integral it is assumed that the influence of the arising higher modes on the distribution function of the electric field in the output aperture is negligibly small and can be disregarded. In addition, the integration over the elliptical region of the output aperture is replaced by integration over a circular region, corresponding to the transverse cross section of the wave guide. With this, the expansion of the integrand in a series of Bessel functions makes it possible to use in the integration the orthogonality conditions of these functions to obtain the sought directivity pattern in closed form. The resultant formulas describe directivity patterns for the propagation of an arbitrary type of TM or TE wave in the wave guide. In the case of a type TE_{11} mode and a wave guide with diameters 0.75λ , where λ is the wavelength in the air,

Card 2/3

EAST GERMANY/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6739

the computed diagrams for values of $\alpha = 0^\circ, 30^\circ, \text{ and } 60^\circ$ are given for the polarization of the vector E, coinciding with the direction of the major axis of the ellipse of the output aperture. The character of the radiation in the H plane remains unchanged for all three cases, and the directivity pattern in the E plane becomes highly asymmetrical as α is increased.

Bibliography, 6 titles. -- D.M. Sazonov

Card 3/3

POLAND/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6752

Author : Pogorzelski, S.

Inst : -

Title : Calculation of the Effective Distance Over a Spherical Earth's Surface

Orig Pub : Prace Przemysl. inst. telekomun, 1959, 9, No 26, 21-30

Abstract : The author considers the problem of calculating the range of a transmitter over a spherical earth's surface in the interference zone under conditions of normal wave propagation. Simplifications which are typical for radar applications are introduced in the analysis. Particular attention is paid to the question of the phase center of the transmitting antenna and a correct determination of the height of the suspension of the antenna over the earth. Formulas are obtained for the coordinates of the phase center, for the direction of the maximum radiation

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POLAND/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6752

of the linear antenna, and for a plane aperture.

Card 2/2

EAST GERMANY/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6756

Author : Meyer, E., Kuttruff, H., Severin, H.

Inst : -

Title : Experimental Determination of the Effective Reflecting Area of Metallic Bodies of Cylindrical Form.

Orig Pub : Z. angew. Phys., 1959, 11, No 1, 1-6

Abstract : A procedure is considered and results are given of an experimental determination, at 3.2 cm wavelength of the effective reflection area of metallic bodies of cylindrical form with a ratio of approximately 10 of length ℓ to the diameter. The dependence of the effective reflection area on the angle of incidence of the wave and on the ratio ℓ/λ in the range $1.8 < \ell/\lambda < 25$ was investigated. Many of the characteristics given in the paper indicate a monotonic increase of the effective reflection area with increasing ℓ/λ . -- A.V. Kantov

Card 1/1

CHINA/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6793

Author : Huang Wu-han, Ling Jan-dah, Ho ChangOshing

Inst : Institute of Electronics, Chinese Academy of Sciences

Title : Faraday Rotation and Losses in Ferrites in the 3-cm Band

Orig Pub : Uli synebao, Acta phys. sinica, 1958, 14, No 6, 431-441

Abstract : The Faraday rotation and the losses in ferrite rods and disks (Ni-Mg, Mg-Mn and Ni-Zn) were measured at 9200 Mcs in a round waveguide at room temperature, as a function of the intensity of the longitudinal magnetic field. The Ni-Mg composition varied from pure NiFe_2O_4 to MgFe_2O_4 . At a sintering temperature of 1300°C , the best properties are possessed by ferrites with a composition from $\text{Ni}_{0.7}\text{Mg}_{0.3}\text{Fe}_2\text{O}_4$ to $\text{Ni}_{0.8}\text{Mg}_{0.2}\text{Fe}_2\text{O}_4$. The losses in these ferrites are small (close to the losses in MgFe_2O_4).

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CHINA/Acoustics - Ultrasonic.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6793

The results of the measurements for three types of ferrites are given in the form of graphs and tables, on the basis of which a detailed discussion comparison is made of the properties. In conclusion, a survey is given of the linear theory of the Faraday rotation of linearly polarized waves, propagating in a wave guide with a longitudinally-magnetized ferrite.

Card 2/2

CZECHOSLOVAKIA/Acoustics - Architectural Acoustics.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6861

Author : Hosek Jiri

Inst : -

Title : Measurement of Losses of Transmitted Power in Wave Guide Circuits, Ranging from 0.3 to 10 db.

Orig Pub : Slaboproudy obzor, 1959, 20, No 4, 231-233

Abstract : A procedure is described for determining the total losses introduced in microwave transition devices by means of an absorption-type power meter. The values of the power received by the meter directly from the generator and through the tested device are measured. The ratio of these powers gives the value of the total losses. The losses due to reflection can be separated from this quantity by calculation, using separately measured valued of the input coefficient of reflection from the investigated device, loaded by a non-reflecting absorber. -- A.I.

Koval'chuk

Card 1/1

EAST GERMANY/Acoustics - Audition and Speech.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6885

Author : Mezger, P.G., Strassl, H.

Inst : Stockert, *Radio-Star Observation Station, Bonn,**
Astronomic Institute, The University, Munster, East
Germany

Title : Thermal Radiation from the Moon at 1420 Mcs

Orig Pub : Z. Astrophys., 1959, 48, No 1, 72-76

Abstract : Results are given of observations, carried out from 30
April, to 22 June 1958, (73 days of observation) with
the 25-meter radio telescope of the Radio Astronomy
Observatory of the Bonn University. The conversion of
the resultant antenna temperatures of the moon into
effective temperatures, averaged over the moon's disk
with allowance for the variation of its visible radius,

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EAST GERMANY/Acoustics - Audition and Speech.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6885

using well known parameters of the antenna, has shown
that the moon temperature at 1420 Mcs remains constant
within $\pm 2\%$ and its value is 250°K , with a possible
systematic error of $\pm 12\%$. This result is in good
agreement with the well known ideas concerning the
mechanism of thermal radio radiation from the moon, accor-
ding to which the radiation at $\sim 20 \text{ cm}$ comes from a suf-
ficiently deep layer under the moon's surface ($>15 \text{ cm}$),
when there are no considerable temperature variations
during the course of lunation.

Card 2/2

POLAND/Acoustics - Audition and Speech.

J-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6892

Author : Smak, J.

Inst : -

Title : New Results of Radio Observation of the Hydrogen Line
at 21 cm.

Orig Pub : Postepy astron., 1958, 6, No 4, 173-177

Abstract : Survey of work performed in Kootwijk (Holland) in 1953 -
1955 by a group of radio astronomers under the general
leadership of Oort and Van de Hulst.

Card 1/1

EAST GERMANY/Optics - Geometrical Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6930

Author : Gosele, K.

Inst : Institute of Technical Physics, Stuttgart, West Germany

Title : On the Determination of the Dimensions of Noise Silencers
Operating on the Reflection Principle

Orig Pub : Hoch frequenztechn. und Elektroakust., 1959, 68, No 1,
15-18

Abstract : The advantages of silencers with reflection over silencers
with sound absorption in the absence of absorbing material,
which becomes contaminated and deteriorates with time.
Silencers in the form of broadened sections of a tube
have less damping than silencers in the form of branches.
Calculations are given, along with dimensions of apparatus
and the results of the measurements of the damping for

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EAST GERMANY/ Optics - Geometrical Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6930

whistles and various combined silencers. The damping in narrow-band silencers reaches 50 -- 80 decibels, in broadband ones it is approximately 40 decibels. -- D.Z. Lapashev

Card 2/2

EAST GERMANY/Optics - Geometrical Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6940

Author : Erler, W.

Inst : Technical College, Dresden, West Germany

Title : Apparatus for Calibration of Vibrations and Shock Meters

Orig Pub : Hochfrequenztechn. und Elektroakust., 1959, 68, No 1, 18-25

Abstract : Analytic expressions are derived for the sensitivity in the calibration of vibration meters by the method of reciprocity with the aid of electrodynamic and piezoelectric converters. In the case of a double electrodynamic vibration table (L) the sensitivity of the calibrated converter (CC) is calculated from the formula

Card 1/4

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6940

$$B_a = \sqrt{\frac{U_{31}U_{32}}{U_{21}I_2} \cdot \frac{m_s + m_g}{m_g} \cdot \frac{m_s}{\omega} \cdot \frac{a_0}{a}}$$

where U_{31} is the no-load voltage on the calibrated converter in excitation of an auxiliary radiator (AR, U_{21} is the corresponding voltage on a reversible converter (RC), U_{32} is the voltage on the CC in the excitation of the RC, I_2 is the current in the RC coil in excitation of the RC, m_g the mass of the permanent magnet, m the mass of the moving system, a_0 the value of the relative frequency characteristic in the linear portion, a the corresponding value for frequencies approaching resonance of the system, and ω is the angular frequency. The ratio a_0/a is a correction for the non-uniformity of the frequency

Card 2/4

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6940

characteristic of the vibration stand. Analogous expressions are obtained for the case of a vibration stand (II) with piezoelectric AR, intended for higher frequencies. the frequency characteristic of the vibration table I has a linear portion from 100 to 1500 -- 2000 cycles and admits of measurement with allowance for corrections in the range 30 -- 3000 cycles. For vibration table II measurements are permissible with allowance for correction from 500 to 8,000 cycles, but the setup requires a more sensitive receiving channel with active filters. The broadening of the range to frequencies below 300 cycles has been carried out with the aid of an optical reading of the amplitude. Use was made in the constructions of "maniperm" magnets with diameter of 97 and 110 mm. The length of the entire system in the vibration stand I is 161 mm, and in vibration stand II it is 45 mm. The mandrels of the coils are made of plexiglas. The winding is double layer,

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EAST GERMANY/Optics - Geometrical Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6940

80 turns of copper wire 0.25 mm in diameter. From the condition of the permissible errors, the mass of the moving system should be approximately five times greater than the mass of the CC. The error introduced by the inaccuracy in the determination of the mass is approximately 0.6%. The frequency characteristic has been measured with an error of 2%. The average discrepancy in the calibration by the reciprocity method and in the optical reading is 2.2%. Sketches of the construction, block diagram, and electric diagrams of the apparatus, equivalent circuits, and also measurement results are all given. Bibliography, 9 titles. -- D.Z. Lopashev

Card 4/4

POLAND/Optics - Optical Media

K-

Abs Jour : Ref Zhur Fizka, No 3, 1960, 6948

Author : Kurzeja Helena

Inst : -

Title : Procedure for Measuring the Level and the Spectrum of Industrial Noise by Means of 1/3 Octave Filters.

Orig Pub : Pomlary, automat., kontrola, 1958, 4, No 11, 483-488

Abstract : The use of filters with a bandwidth of 1/3 of an octave makes it possible to obtain a more accurate spectral characteristic of the noise, sufficient for the choice of effective sound absorber. If it is necessary to suppress noise in the source itself, a highly selective spectrum analyzer must be used. The measurements described were carried out by means of a magnetic tape recorder and the recording was investigated by means of a spectrometer and a high speed level recorder. The errors are calculated, introduced by the apparatus used; the total

Card 1/2

POLAND/Optics - Optical Media

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6948

magnitude of the errors does not exceed ± 4 db. The results of the measurements are represented in the form of tables and graphs.

Card 2/2

CZECHOSLOVAKIA/Optics - Optical Media.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6954

Author : Kucka Jozef

Inst : -

Title : Measurements of Noise in Certain Manufacturing Plants.

Orig Pub : Bezpecn. a hyg. prace, 1959, 9, No 7, 209-212

Abstract : No abstract.

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HUNGARY/Optics - Optical Media.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6956
Author : Bajnoh Lajos
Inst : -
Title : Test of Metal-Cutting Machines for Noise
Orig Pub : Sep, 1959, 11, No 7, 253-258
Abstract : No abstract.

Card 1/1

EAST GERMANY/Optics - Optical Technology

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6962
Author : Kor, S.K.
Inst : The University, Allahabad, India
Title : An Ultrasonic Method for Measuring the Mass-Action
Equilibrium Constant of Electrolytes.
Orig Pub : Z. phys. Chem. (DDR), 1959, 210, No 5-6, 288-292
Abstract : An optical method of light diffraction by ultrasound at
t 20° was used to measure the absorption of ultrasound
in aqueous solution of $MnSO_4$ in the frequency range from
1 to 6 Mcs for molar concentrations of electrolyte from
0.0025 to 1.0. Calculation of the excess absorption coef-
ficient at a wave length λ gives a relaxation frequency
of approximately 3 Mcs. This frequency increases with in-
creasing molar concentration from 0.0025 to 0.02.

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EAST GERMANY/Optics - Optical Technology.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6962

The sharp increase in the absorption of ultrasound in a solution of MnSO_4 in connection with the dissociation process. To calculate the degree of dissociation, use is made of the relation $f^* = f_0^* \sqrt{1 + \frac{1-n}{n} K(2 - F.c.n)}$ where f^* is the relaxation frequency for the molar concentration c , f_0^* is the relaxation frequency for $c = 0$, n is the degree of dissociation, and F is the function of ion concentration and is constant. The equilibrium constant K is calculated from the formula $K = c.b_{\pm}^2 .n/(1 - n)$, where b_{\pm}^2 is the mean squared coefficient of activity, determined from the Debye-Huckel theory. The value of the constant, $K = 40 \times 10^{-4}$, determined from acoustic measurements, is in good agreement with the result $K = 50 \times 10^{-4}$, obtained when using the conductivity method,
Bibliography, 7 titles. -- Yu.S. Trelin

Card 2/2

RUMANIA/Optics - Optical Technology.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6989

Author : Ionescu Zane N.

Inst : -

Title : Production Control of Parts of Complicated Form with the Aid of Ultrasound

Orig Pub : Rev. cailor ferate. 1959, 7, No 4, 290-203

Abstract : No abstract.

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RUMANIA/Optics - Optical Technology.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6990
Author : Gavrilă, I.
Inst : -
Title : Ultrasounds in Solid Bodies. Rumanian Ultrasonic Flaw
Detector
Orig Pub : Gaz. mat. si fiz., 1959, B10, No 5, 274-278
Abstract : No abstract.

Card 1/1

CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7055
Author : Nabelih Bohumil
Inst : Optics Laboratory, Czechoslovak Academy of Sciences,
Prague, Czechoslovakia
Title : Correction of Optical Systems with the Aid of Differential
Transfer Coefficients.
Orig Pub : Jemna mech. a opt., 1959, 4, No 4, 128-129
Abstract : A method is proposed for correcting optical systems, in-
troduced by M'Auley and Cruikshank (M'Auley A.L., Cruikshank
F.D. Proceedings of the Physical Society, 1945, 57, 302).
Tables are given which make it possible to compare the
reliability of the calculation with the trigonometric
method.

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CHINA/Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7058

Author : -

Inst : -

Title : Rare Earth Optical Glasses. Second Laboratory of the
Institute of Optics. Precision Machinery, and Instruments.

Orig Pub : Kesyue tunbao, Kekhue tongbao, Nauchn. vestn. Scientia,
1959, No 8, 274-275

Abstract : No abstract.

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CZECHOSLOVAKIA/Optics.

K

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7059

Author : Prokopova, H., Vasko, A.

Inst : -

Title : Transmission of Arsenic Glass in the Range from 15 to 25
Microns.

Orig Pub : Ceskosl. casop. fys., 1959, 9, No 1, 111-112

Abstract : See Referat Zhur Fizika 1960, No 1, 1972.

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CZECHOSLOVAKIA/Optics.-

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7062
Author : Minar, S.
Inst : -
Title : Effect of Tropical Climate on Optical Instruments.
Orig Pub : Jemna mech. a opt., 1959, 4, No 7, 235-237

Abstract : The problem of tropicalization of instruments is raised, and the principal factors that influence the behavior of optical instruments under tropical conditions are summarized and considered. The effects of fungi and the method of fungus proofing is described in greater detail. Certain data on the corrosion of mechanical portions of the instrument are summarized.

Card 1/1

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7073
Author : Bergner, J.
Inst : -
Title : Optical Equipment for Microscopes
Orig Pub : VEB Carl Zeiss Jena Nachr., 1959, 8, No 3-6, 235-248

Abstract : Popular Article.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7074

Author : Beyer Hermann

Inst : -

Title : Microscope for the Measurement of Tracks of High Energy Particles in Photoemulsions.

Orig Pub : VEB Carl zeiss Jena Nachr., 1959, 8, No 3-6, 131-134

Abstract : The nuclear microscope is described. Its constructive features are noted (interference adopter for the control of linearity of the movement of the table and of the objective, thermal insulation, sound recording of the measurement results, without necessitating that the observer move over from the microscope, etc.).

Card 1/1

CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7080

Author : Kral Milan

Inst : -

Title : Instrument for the Control of Phase Differences of Phase Rings of Microobjectives

Orig Pub : Jemna mech. a apt., 1959, 4, No 3, 80-83

Abstract : Description and analysis of the interference method of A.N. Zakhar'yevskiy and A.F. Kuznetsova of an exact method of measuring phase differences, introduced by the phase rings, used for phase-contrast microscopy. The installation developed at the Institute of Precision Mechanics and Optics in Prague is described.

Card 1/1

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7081

Author : Gause Hans

Inst : -

Title : Use of Polarization Microscope

Orig Pub : VEB Carl Zeiss Jena Nachr., 1959, 8, No 3-6, 134-181

Abstract : Detailed survey article on modern polarization microscope, their arrangement, operating principle, different types, additional, parts, and fields of application. Bibliography, 36 titles.

Card 1/1

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7084

Author : Bergner Joachim

Inst : -

Title : Application of a Photoadapter for Microphotography in Polarized Light

Orig Pub : Jenear Rundschau, 1959, 4, No 2, 62-65

Abstract : Description of the features of photography with the aid of microphotoadapters, provided with a viewer for simultaneous observation of the compound. Separating prisms, contained in such adapters, polarize the light additionally and thereby distort the initial form of the image, obtained in the polarization microscope. Optimum conditions of photography are indicated and many colored microphotographs are reproduced. -- A.N. Zakhar'yevskiy

Card 1/1

CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7087

Author : Picmanova Eva

Inst : -

Title : Projection with the Aid of Cold Mirrors

Orig Pub : Jemna mech. a opt., 1959, 4, No 2, 60-61

Abstract : Description of the arrangement of so-called cold mirrors, which reflect only the visible portion of the radiation, their advantages, and also sources of light that can be used with cold mirrors.

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EAST GERMANY/Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7090

Author : Meier, B.

Inst : -

Title : New Interference Microscope for Control and Research by the Method of Multiple-Ray Interference

Orig Pub : Feingeratetechnik, 1959, 8, No 6, 268-269

Abstract : The author describes a microscope made by VEB Carl Zeiss (Jena) for the control of the purity of surface finish of metallic parts, based on the principle of multiple-ray interference. The objectives are 10 and 20 x, magnifications from 70 l to 340 x. The instrument was mounted on a base with a heavy specially-shaped column, on which is displaced a bracket, carrying the tube of the microscope and the mechanism of coarse and fine focusing. The illumination is monochromatic from a thallium lamp. The slip-on (reference) flat plates have reflecting coatings of high

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7090

strength (quartz) with a reflection coefficient up to 95%. However, in the tests of metallic parts the optimum coefficient of reflection is 50%. The reference plates can be inclined about both axes, so that fringes of any desired width and orientation can be obtained. The instrument has a camera for 6 x 9 cm plates. -- A.N. Zakhar'yevskiy

Card 2/2

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7102

Author : Lehmann, R.

Inst : -

Title : Investigation of a Justifying Device and Its Application for Optical and Astronomical Instruments.

Orig Pub : Monatsschr. Feinmech. und Optik, 1959, 76, No 2, 51-52

Abstract : The author considers a justifying device for the control of the direction of the axis of the finder tube from the point of view of general requirements imposed on such devices. The magnitude of motion, required accuracy, sequence, and method of setting, reliability of fixation of the completed installations, possibility of reading the amount of displacement.

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EAST GERMANY/Optics

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7103

Author : Schumann Hilmar

Inst : Technical College, Dresden, East Germany

Title : Simple Determination of the Numerical Aperture of Dry Microobjectives of Any Magnification

Orig Pub : VEB Carl Zeiss Jena Nachr., 1959, 8, No 3-6, 268-271

Abstract : The author describes a device which he perfected for the measurement of the numerical aperture of dry microobjectives, and gives recommendations on its use in different cases. The accuracy of measurement of the magnitude of the aperture reaches 0.03.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7104

Author : Landwehr, R.

Inst : -

Title : Microinterference as a Means of Testing the Shape of Aspherical Surfaces

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 154-166

Abstract : The method proposed for testing the shape of strongly curved aspherical surfaces of rotation consists of observing and measuring a system of interference fringes, formed between the tested aspherical surface and a flat or spherical comparison surface. The latter should be perpendicular to the microscope axis. The table of the microscope should be inclined by measurable angles, so it becomes possible to measure the angles between the normal to the point of observation in the axis of rotation of the surface. In addition, the table should have two

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7104

mutually-perpendicular measurable displacements. Equations are derived for the interference fringes about the points of tangency of the plane and spherical comparison surfaces with convex paraboloids; the author shows how to determine the parameter of the latter from the measurement semi-axes of the elliptical interference fringes. Methods of control of the results of measurement of the form of the surface are indicated. An example of testing parabolic surfaces with a parameter of 40 mm is given.

Card 2/2

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7112

Author : Karolus, A., Fries, D.

Inst : -

Title : New Device for Determining the Velocity of Sound

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 269-282

Abstract : Description of apparatus for the determination of the velocity of sound c , consisting of an ultrasonic modulator (modulation frequency 16 Mcs), in which two quartz plates produce two spatially-separated ultrasonic waves, running opposite to each other. The radiation receiver is an RCA No. 7326 photomultiplier. The light ray is split by means of a semi-transparent mirror into two beams -- measured and compared. By means of a special circuit, the phase difference of the photocurrents produced in the photomultiplier under the influence of both beams is measured. The errors that arise in the measurement

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7112

of the phase difference, due to inaccurate setting of the quartz plates in the modulator and due to variation in the illumination conditions of the photomultiplier cathode by both rays, are investigated. By careful adjustment it was possible to obtain such a phase-difference, that the accuracy of measurement c could be raised to 1.5×10^{-5} at a base of 18 meters, corresponding to an error of 3 km/second. It is noted that the ultrasonic modulator insures approximately 250 times greater accuracy in the measurement of phase differences, than the Kerr cell. The author believes that the accuracy indicated by Bergstrand (see Handbuch der Physik, Vol. XXIV, Springer, 1956, p 31) in the determination of c , namely 0.3 km/second, is too high. -- K.S. Vul'fson

Card 2/2

CZECHOSLOVAKIA/Optis -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7115

Author : Vasko Antonin

Inst : -

Title : Simplification of Formulas for the Calculation of Optical Constants of Absorbing Substances.

Orig Pub : Ceskosl. casop. fys., 1959, 9, No 1, 110-111

Abstract : See Referat Zhur Fizika 1959, No 11, 26024.

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CZECHOSLOVAKIA/Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7117
Author : Langer, V., Koluch, J.
Inst : -
Title : Optical Pyrometer with Infrared Image Converter
Orig Pub : Jemna mech. a opt., 1959, 4, No 7, 220-225

Abstract : The authors indicate the possibility of using an infrared image converter for visual pyrometry at comparatively low temperatures. The described infrared pyrometer operates on the principle of a filament pyrometer with a lower limit of temperature indication of 350° C. In the theoretical part is given the basis for calculating the operating range of the pyrometer, including calculation of the measurement errors, resulting from the properties of the image converter employed.

Card 1/1

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7119
Author : Anacker, F., Mannkopff, R.
Inst : Mineral Institute, The University, Gottingen, West Germany
Title : Emitting Ability of Carbon at Sublimation Temperature
Orig Pub : Z. Phys., 1959, 155, No 1, 16-22

Abstract : The emitting ability of carbon at sublimation temperature is determined by comparing the radiation of the surface of the anode crater of an arc with black-body radiation of the same temperature (at $\lambda \geq 400, 482$ and 640 millimicrons). The comparison was made by photographic registration and subsequent photometry. Optimum conditions of operation of the arc and the requirements that must be satisfied by the carbon material are considered.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7119

On the basis of the data obtained, it is concluded that it is not advantageous to use the arc as a standard radiator. -- T.I. Nikitinskaya

Card 2/2

YUGOSLAVIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7126

Author : Herak, M.J., Kratochvil, J., Herak, M.M., Wrischer, M.

Inst : The University, Zagreb, Yugoslavia

Title : A Light Scattering and Electron Microscope Examination of Monodispersed Metal Iodate Hydrosols

Orig Pub : Croat. chem. acta, 1958, (1959), 30, No 4, 221-230

Abstract : A simple procedure was used to obtain monodispersed hydrosols of lead iodate and lanthanum iodate. In observing the scattering of light by hydrosols, bright colored fringes are seen (the Tyndall spectrum of high order) indicating high monodispersness of the system and spherical shape of the particles. The lead iodate is unstable, and this phenomenon can be observed in it after mixing the solution only for 10 - 15 minutes. For longer

Card 1/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7126

measurements, the lead iodate was stabilized by filtration. Using a corresponding photometer, the angular distribution of the scattered radiation was measured. This distribution is characterized by the existence of sharp maxima at definite angles of observation. The dimensions of the scattering particles were estimated by a method described by Lamer and Johnson and also from the results of measurements made by an ordinary and an electron microscope. The average radius of the particles in the lanthanum iodate is 700μ , and in the lead iodate it is 800μ . The question of the mechanism of production of monodispersed hydrozole of metal iodate and concerning the shape of the particles is discussed. Bibliography, 19 titles. -- N.A. Voyshvillo

Card 2/2

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7132

Author : Schill Frantisek

Inst : -

Title : Measurement of Stresses in Glass by the Method of Senarmon With the Aid of a Polarization Microscope.

Orig Pub : Sklar a keramik, 1959, 9, No 3, 67-72

Abstract : The theory of the Senarmon compensator, used for the analysis of electrically polarized light and consisting of $1/4$ -wave plates and an analyzer, is described in detail. The Senarmon method was realized with the aid of a Leitz polarization microscope and used to measure double refraction in glass.

Card 1/1

POLAND/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7137

Author : Suffczynski, M.

Inst : Imperial College, London, Great Britain

Title : A Model for Investigation of the Optical Properties of Noble Metals

Orig Pub : Bull. Acad. polon. sci. Ser. sci. math. astron. et phys., 1959, 7, No 3, 169-173, XIII

Abstract : In the approximation of nearly-free electrons, the theories developed for the optical properties of noble metals. The two-band method is considered. The energy surfaces of these bands are taken in the form

$$E \pm (k_x, k_y, k_z) = \frac{\hbar^2}{2m} [k_x^2 + k_y^2 + (k_0 - k_z)^2 + k_0^2 + 2k_0 \sqrt{(k_0 - k_z)^2 + V^2}]$$

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POLAND/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960,

Here k_x , k_y , and k_z are the components of the wave vector. The z axis is directed along a line joining the center Γ of the Brillouin zone with the center L of its hexagonal face, k_0 is the distance ΓL in reciprocal space, and V is proportional to the energy of the gap at the point L . The surface in reciprocal space, covering the field states, is taken from $E_- = E_F$, where E_F is the Fermi level. The matrix elements of the momentum operator are assumed to be constant. The dielectric constant and the coefficient of absorption obtained as a result of the calculation added to

Card 2/4

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7137

the corresponding Drude coefficient, and the damping coefficient $k(\lambda)$ was calculated. The calculated values are finite, if the Fermi surface lies inside the Brillouin zone, and have singularities if the Fermi surface makes contact with the boundary of the Brillouin zone. These singularities can be eliminated by assuming that the effective masses in the lower and upper zones are not exactly equal to each other. In accordance with the experiment, the curve $k(\lambda)/\lambda$ as a function of λ has a minimum. In order for this minimum to lie at the same wavelength as in the experiment, one must assume that V is small. The energy of the photons corresponding to the minimum is exactly equal to the energy gap at the point L, when the Fermi surface touches the boundary of the Brillouin zone, and is greater than this gap if the former lies entirely inside the latter. With this, only vertical optical transitions are considered. The width of the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 7137

minimum on the dispersion curve is determined by the ratio of the width of the forbidden zone to the energy of the free electron at the point L of the Brillouin zone, and is greater, the smaller this ratio. The minimum on the dispersion curve is connected with the increase in the density of the states with decreasing distance to the boundary of the Brillouin zone.

Bibliography, 18 titles. -- E.L. Nagayev

Card 4/4

CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7138
Author : Knittl Zdenek
Inst : -
Title : On the Energy Balance of the Optics of Metals
Orig Pub : Ceskosl. casop. fys., 1959, 9, No 1, 4-15
Abstract : No abstract.

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ROUMANIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7142
Author : Parausanu, V.
Inst : -
Title : Quantum Yield in a Photochemical Process
Orig Pub : An. Prom. -Ser. Ser. chim., 1958, 13, No 4, 47-65
Abstract : Survey article. The principal roles of photo-chemistry, quantum yield, and its experimental determination are considered.
Bibliography, 15 titles.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7143

Author : Haremann, R., Pietsch, H.

Inst : Humboldt University, Berlin, East Germany

Title : Photochemical Reduction of Thionin. Part 3. Effect of Fluorides on the Photochemical Sensitivity of Complexes of thionin, selenin, 2,7-diaminooxazine, and Methylene Blue with Divalent Ions of Iron

Orig Pub : Z. phys. chem. (DDR), 1959, 210, No 5-6, 232-245

Abstract : From among the dyes selenin (e,7-diaminophenselenazine), thionin, 2,7-diaminophenoxazine, and methylene blue, thionin discolors most rapidly of all photochemically in the presence of Fe^{2+} . No direct connection is observed between the difference in reduction-oxidation potentials (of the system dye plus Fe^{3+}) and the photochemical

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7143

sensitivity. The speed of the dark reaction, to the contrary, increases with increasing difference of the reduction-oxidation potentials. The addition of fluorides leads to slowing down of the dark reaction. Acetone partially removes the effect of the fluorides.
For Part 2. see Ref Zhurnal Khimiya, 1958, No 23, 76760.

Card 2/2

EAST GERMANY/Optics

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7144

Author : Haremann, R., Reimer, K.G.

Inst : Humboldt University, Berlin, East Germany

Title : Photochemical Reduction of Thionin. Part 4. Kinetics of Dark Reaction, Occurring in Photochemical Reduction of Thionin by Divalent Ions of Iron.

Orig Pub : Z. phys. Chem. (DDR), 1959, 211, No 1-2, 26-39

Abstract : The oxidation of leucothionin by Fe^{3+} , which is constantly superimposed on the photochemical reduction of thionin by Fe^{2+} as a reverse dark reaction, proceeds independently of the concentration of the Fe^{3+} as a first-order reaction, which is retained also in equimolecular concentrations of the reaction partners. The speed of reaction depends strongly on the concentration of Fe^{3+} . The kinetic

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7144

measurements have shown that the dark reaction takes place with a complex of leucothionin and Fe^{3+} as an intermediate step.

For Part 3 see abstract 7143.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7145

Author : Haremann, R., Reimer, K.G.

Inst : Humboldt University, Berlin, East Germany

Title : Photochemical Reduction of Thionin. Part 5. Kinetic
Proofs of the Existence of a Thionin Complex with Divalent
Ion and Iron

Orig Pub : Z. phys. Chem. (DDR), 1959, 211, No 1-2, 63-73

Abstract : The photochemical reduction of thionin by Fe^{2+} presupposes
a preliminary formation of photochemical-active complex
of thionin and Fe^{2+} . The speed of reaction is determined
by the concentration of the ions of the complex. The dis-
sociation constant of the complex is determined from the
dependence of the reaction rate on the concentration of
 Fe^{2+} . The use of solutions of Fe^{2+} salts, which are

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K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7145

completely free of Fe^{3+} , has made it possible to obtain
well-reproducible kinetic measurements. --
For Part 4 see abstract 7144.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7149

Author : Braunbek Nerner

Inst : University of Tübingen, West Germany

Title : Concerning the Diffraction from an Aperture in a Non-Planar Screen

Orig Pub : Z. Phys., 1959, 156, No 1, 66-77

Abstract : Using a previously published approximate method (Z. phys. 1950, 127, 381, 405), the author considers diffraction from an aperture in a non-planar screen. For the particular case of a round aperture in a funnel-like screen, the diffraction field is calculated on the axis, behind the screen, in the case of a plane scalar incident wave, and for an incident plane electromagnetic wave, propagating in the direction of the axis.

Card 1/1

CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7169

Author : Chen'I-syun', Syui Syui-yun,

Inst : -

Title : On the Analysis of Curves of Thermal Glow with Allowance for the Relative Probabilities of Repeated Localization of the Electrons.

Orig Pub : Uli syuebao, Acta phys. sinica, 1959, 15, No 7, 393-396

Abstract : It is shown that taking into account the relative probability of repeated localization, it is possible to determine, by analysis of the curves of thermal glow, simultaneously the depth of the fusion levels and the ratio of the probabilities of recombination and localization of the electrons.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7170

Author : Nilke, K.-Th.

Inst : German Academy of Sciences, Institutes for Radiation Sources, Berlin, East Germany

Title : Aluminum-Lithium Arsenate, Another Phosphor of the Arsenate Series.

Orig Pub : Z. phys. Chem. (DDR), 1959, 210, No 5-6, 260-266

Abstract : The author describes the preparation and luminescent properties of aluminum-lithium arsenate, activated with manganese. This phosphor, having high radiation brightness (up to 20% of the brightness of Mg-Li arsenate) has a composition $6\text{Al}_2\text{O}_3 \cdot 6\text{Li}_2\text{O} \cdot \text{As}_2\text{O}_5 (10^{-2}\text{Mn})$ (I). It is well excited with light with a wavelength of 365 m μ . The emission spectrum of the phosphor includes bands

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7170

with maxima at 639, 645, 654, and 666 m μ , ascribed to ions of Mn^{4+} . It is noted that the components of the phosphor form a chemical compound, and this is confirmed by x-ray structural analysis. The increase in the time and the increase in the roasting temperature of the phosphor reduce the intensity of the glow due to the volatilization of the arsenic. It is established that only a portion of the manganese is in the 4-valent state. The intensity of glow diminishes rapidly, starting with 2000°C. It is noted that the similarity of the emission spectra of magnesium arsenate, magnesium-lithium arsenate, and aluminum-lithium arsenate in the presence of multivalent magnesium in these phosphors indicates a similarity of the structures surrounding the manganese in these substances. -- Yu. Leonov

Card 2/2

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7172

Author : Riekl, N., Ortmann, H.

Inst : -

Title : On the Structure of Glow Centers in Activated Zinc-Sulphide Phosphors

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 3-14

Abstract : A ZnS-Cu phosphor with blue glow (BG) glows when calcined into a phosphor with green glow (GG). Investigation was made of the dependence of the ratio of intensities $V = I_g/I_b$ on the temperature of the preliminary calcination. The measurements were carried out with two phosphors, which have green glow at room temperature: ZnS-10-4% Cu by weight with an admixture of NH_4Cl (I), and the same phosphor without the NH_4Cl (II). It was established that the transformation of the phosphor with BG into a phosphor with GG occurs Already at roasting temperature on the

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7172

order of $200^\circ C$, and further increase in the roasting temperature of phosphor I, causes V to increase monotonically, while in the case of II it goes through a maximum near $360^\circ C$. Not all the BG centers are converted into GG centers, and to each roasting temperature above $200^\circ C$ there corresponds an equilibrium value of V , to which the transformation tends upon prolonged roasting. If the phosphor is rapidly cooled to room temperature, this equilibrium freezes. At room temperature there occurs a slow inverse transformation of the GG centers into BG centers. Under the assumption that the transformation $BG \rightarrow GG$ obeys the monomolecular law, an estimate is made of the reaction energy, $F \approx 0.38$ ev. An estimate of the activation energy of the reverse process, $GG \rightarrow BG$ yields $q \approx 0.67$ ev. In the phosphor ZnS-Cu with BG, one observes upon heating to $100--200^\circ C$ not only an increase in the ratio V , but also an increase in the absolute value

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 7172

of the intensity of the green band. Upon sudden cooling of the phosphor, this increase in GG is partially frozen in. In ZnS-Ag phosphor and in phosphor without admixture, which also have BG at room temperature, no production or increase in the green band with increase in temperature were observed. From the experimental data, above all from the low values of the activation energy of the GG BG transformation, one can conclude that this transformation is not connected with the penetration or removal of anions from and to the lattice (S^{2-} or Cl^-). It may also be due to the diffusion of cations Cu^+ or Zn^{2+} in the interstices (and not Cu^{2+} , Zn^{+} , or Zn , since they gave paramagnetic structures which actually were not observed (Ref Zhur Fiz. 1957, No 1, 2376)). In accordance with these considerations, one proposes as the model of the BG center the Cu^+ ion in the interstice, along with Cu^+ in the cation site.
-- Kh.F. Kyaembre

Card 3/3

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7176

Author : Wilke, K.-Th.

Inst : Physical Technical Institute, German Academy of Sciences, Berlin, East Germany

Title : Preparation of Pure BaS Luminophors from Barium Trithiocarbonate.

Orig Pub : Monatsber Dtsch. Akad. Wiss. Berlin, 1959, 1, No 3, 177-180

Abstract : The proposed and investigated method of preparing BaS from $BaCS_3$ (by heating in a N_2 atmosphere at $700^\circ C$) makes it possible to obtain a relatively pure material for luminophors.

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 7179

Author : Antonov-Romanonskiy, V.V.

Inst : The Institute of Physics, Academy of Sciences, USSR

Title : On the Electroluminescence of Powdered Zinc Sulphide Layers.

Orig Pub : Chekhosl. fiz. zh., 1959, 9, No 2, 146-160

Abstract : The author compares and interprets the results of many experimental works of the Institute of Physics imeni P.N. Lebedev, Academy of Sciences USSR, on problems of electroluminescence. Some of the papers have been previously published. 1. In measurements of electroluminescence layers of ZnS-Cu of thickness equal to one small crystal ($\sim 5 \mu$), a region is reached with increase in voltage, in which the usual dependence of the brightness B on the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 7179

voltage $B = A \exp(-b/\sqrt{U})$ is replaced by a dependence of the form $B = A' \exp(-b'/U)$. In this case the thickness of the barrier region becomes comparable with the thickness of the small crystals and a further increase in the voltage has led to a linear increase in the average field strength. The result agrees with the idea that usually in small electroluminescent crystals the ionization by electron impact takes place in a small region of the strong field, and in the remaining portion this process does not take place. 2. Upon comparison of the spectra of electroluminescence and photoluminescence of electroluminophors with two or three activators, of which one is a rare-earth element, it has been established that the relative intensity of the lines Nd and of other rare earths is the same in electroluminescence as in photoluminescence, and this gives grounds for the conclusion that the glow centers are the same in photo and

Card 2/4

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7179

electroluminescence. A comparison of the darkness of electroluminescence and the afterglow of photoluminescence, in which the kinetics are the same, has shown that 7% of the volume glowed in electroluminescence.

3. The sharper drop of the relaxation curve of electroluminescence in its initial portion compared with the curve for photoluminescence is offered as evidence that in regions with more intense field there is a greater concentration of glow centers.

4. In the excitation of phosphors with trapezoidal pulses, the dc component of the glow started burning slower than the alternating component. The infrared radiation acts strongly on the dc component. It is known that the effect of infrared and red light becomes stronger the smaller the concentration of the ionized centers in the phosphor. Both facts serve as grounds for stating that the excitation is transferred from the

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 7179

region of field concentration to the entire volume of the crystal.

Bibliography, 18 titles. -- A.G. Gol'dman

Card 4/4

CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7182

Author : Patek Karel

Inst : Physics Institute, Czechoslovak Academy of Sciences,
Prague, Czechoslovakia

Title : On the Photoelectroluminescence of ZnS-Cu

Orig Pub : Ceskosl. casop. fys., 1958, 8, No 5, 628

Abstract : The author has investigated the difference of ultraviolet on the brightness wave of electroluminescence of ZnS-Cu; an increase in brightness of the principal maximum is observed and a reduction in the amplitude of the secondary maximum, along with a certain change in the phase shift. It is proposed that under the influence of the ultraviolet radiation the number of conductivity electrons increases and these reduce the effect of polarization in the small

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CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7182

ZnS crystals and increase the number of electrons accelerated by the electric field. -- V. Kopetskiy

Card 2/2

CZECHOSLOVAKIA/Optics

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7183
Author : Patek Karel
Inst : -
Title : On the Photoelectroluminescence of ZnS-Cu
Orig Pub : Chekhosl. fyz. zh., 1958, 8, No 5, 612-613
Abstract : See abstract No 7182.

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CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7184
Author : Patek, K.
Inst : Institute of Physics, Czechoslovak Academy of Sciences,
Prague, Czechoslovakia
Title : On the Photoelectroluminescence of ZnS-Cu
Orig Pub : Chekhosl. fyz. zh., 1959, 9, No 2, 161-167
Abstract : The effect of weak ultraviolet on electroluminescence of ZnS-Cu has been investigated. A more detailed description of the experiments, the results of which were reported earlier (abstract 7182), is given. A qualitative explanation of the phenomena is given on the basis of the assumption that the ultraviolet causes an increase in the number of electrons in the conduction band and this increases the probability of excitation of the activators by the

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CZECHOSLOVAKIA/Optics

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7184

accelerated electrons. Further explanations, as indicated,
are not the only ones possible. -- A.G. Gol'dman

Card 2/2

ROUMANIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7209

Author : Agirbiceanu, I., Ghita, C., Topa, V.

Inst : -

Title : Effect of Argon on the Spectrum of I₂ Vapor

Orig Pub : Rev. phys. Acad. RPR, 1958, 3, No 3-4, 195-202

Abstract : No abstract.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7262

Author : Steger Eberhard

Inst : -

Title : Infrared Spectra of Substances in Small Amounts

Orig Pub : Wiss. Z. Techn. Hochschule Dresden, 1958-1959, 8, No 1, 214

Abstract : Abbreviated text of a paper dealing with the possibilities of recording infrared spectra of small amounts of substances without micro attachments or condenser systems. A spectrum of urea, obtained in the presence of 10 μ g of substance, pressed from 50 μ g of KBr in a press 2 mm in diameter, is reproduced. -- B. Kiselev

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ROUMANIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7291

Author : Kukurezyanu, I.

Inst : -

Title : Raman Spectra of Equimolecular Aqueous Solutions of Acetic Acid

Orig Pub : Rev. phys. Acad. RPR, 1958, 3, No 3-4, 239-245

Abstract : On the basis of an investigation of the character of the redistribution of intensity between components (1674, 1712, and 1754 cm^{-1}) of the Raman lines of the C=O bond in aqueous solutions of acetic acid, the author has established the forms of associations both between the molecules of the acid, and between the molecules of the acid and the water, on the basis of the hydrogen bonds. Conclusions from spectroscopic data are confirmed by the character of the dependence of the density of the solution of the concentration. Bibliography, 8 titles. -- V.M. Pivovarov

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7313

Author : Bucka, H., Kopfermann, H., Otten, E.W.

Inst : Physics Institute, The University, Heidelberg, West
Germany

Title : Determination of Nuclear Quadrupole Moments of Radioac-
tive Isotopes Cs¹³⁵ and Cs¹³⁷

Orig Pub : Ann. Physik, 1959, 4, No 1-5, 39-49

Abstract : The method of double resonance was used to investigate
the high frequency transitions in the hyperfine structure
of excited

$7^2P_{3/2}$ state in the first spectrum of Cs¹³⁵
and Cs¹³⁷. From the Casimir formula and from the experi-
mentally obtained values of the constant of quadrupole

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EAST GERMANY/Optics.

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7313

interaction, the authors have determined the quadrupole
moments Q of the nuclei Cs¹³⁵ and Cs¹³⁷. Without the
Sternheimer correction, Q (Cs¹³⁵) = $(+0.049 \pm 0.002) \times$
 10^{-24} cm^2 and Q (Cs¹³⁷) = $(0.050 \pm 0.02) \times 10^{-24} \text{ cm}^2$.
-- N.Yashin

Card 2/2

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizka, No 3, 1960, 7314

Author : Fricke, G., Kopfermann, H., Penselin, S., Schlupmann, K.

Inst : -

Title : Determination of the Hyperfine Structure Splitting for the Ground State

$^2D_{3/2}$ and $^2D_{5/2}$ of Scandium and the
Quadrupole Moment of Sc^{45} Nucleus.

Orig Pub : Z. Phys., 1959, 156, No 3, 416-424

Abstract : Using a magnetic-resonance atomic-beam method, measurement was made of the splitting for the hyperfine structure of the lower electron level

$^2D_{3/2}$ and $^2D_{5/2}$ of the stable
isotope Sc^{45} . These disintegrations yielded the following
values of the constants of the magnetic dipole and electric

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7314

quadrupole interaction (in megacycles): $a_{3/2} = 269.560 \pm$

0.02 ; $b_{3/2} = -26.37 \pm 0.1$; $a_{5/2} = 109.034 \pm 0.01$; $b_{5/2} =$

-37.31 ± 0.01 . The values of the electric quadrupole
moment, calculated from $b_{3/2}$ and $b_{5/2}$, differ by 5%,

showing that the configuration $3d4s^2$ of the ground states
is perturbed by higher configurations. Averaging these
two values yields a quadrupole moment

$$Q(Sc^{45}) = -(0.22 \pm$$

$0.01) \times 10^{-24} \text{ cm}^2$.

See Also Ref Zhur Fizika, 1959, No 12, 28493.

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CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7316

Author : Plzak

Inst : -

Title : On the Activity of the Society for Spectroanalysis Research

Orig Pub : Hutn, listy, 1959, 14, No 1, 60

Abstract : A brief contents is given of the papers delivered to the June 1958, meeting of the society.
1) Rapid determination of niobium and silicon in 18-8 steels; 2) possibility of employing spectroanalysis in the ceramic industry; 3) application of a spectrograph to the study in the changes of the chemical composition of surface layers of steel.

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ROUMANIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7318

Author : Kathrein, I.

Inst : -

Title : Spectral Analysis and the Prospects of Its Application in the Food Industry.

Orig Pub : Ind. Aliment, Prod. veget., 1959, No 1, 3-8

Abstract : No abstract.

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HUNGARY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7325
 Author : Bardocz Arpad, Tabeling, W. Raymond
 Inst : -
 Title : Spectrochemical Analysis Using Time Resolution of the Spectra with the Aid of a Rotating Disk
 Orig Pub : Magyar kem. folyoirat, 1959, 65, No 3, 126-128

Abstract : On working with spark spectra of a strong radiation that arises at the beginning instants of the spark discharge, which have a continuous spectrum, mask the weak spectral lines used for the analysis. This reduces the slope of the calibration curves and results in lesser sensitivity and accuracy of the analysis. The use of generators with electronic control makes it possible, by using a synchronously rotating disk with holes, to cut off the radiation of the initial period of glow of the spark and thereby get rid of the noise.

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CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7330
 Author : Hsu Sheng-Meim Ho I-djen
 Inst : Institute of Metal Research, Academy Sinica, China
 Title : Estimate of the Slope of the Calibration Curve in Spectrochemical Analysis
 Orig Pub : Uli synebao, Acta phys. sinica, 1959, 15, No 4, 178-185

Abstract : To establish the value of the relation between the slope of the calibration curve and the concentration of the element, investigations were performed with 13 spectral lines of double multiplicity, belonging to the spectra of cobalt and nickel. The results of the investigation show that the slope of the calibration curves depends on the concentration and that for a definite region of concentrations, the slope of the curves of the spectral lines

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CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7330

of given multiplicity varies linearly with the natural logarithm of the intensity of the corresponding lines.

Card 2/2

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizkka, No 3, 1960, 7345

Author : Muller- Uri G.

Inst : Central Institute for Casting Engineering, Leipzig,
East Germany

Title : Spectrochemical Determination of Magnesium in Cast Iron
Using Solid Electrodes.

Orig Pub : Exptl. Techn. Phys., 1959, 7, No 2, 59-66

Abstract : Specimens for the analysis of cast in a metallic chill mold. The casting is a metallic rod with a bulky bulge on top and a neck for conveniently separating the latter. It was established experimentally that specimens of this kind are sufficiently homogeneous. The magnesium contents in the standards was determined by spectral analysis of the dissolved charges against synthetic standard

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7345

solutions. For the analysis of the metallic specimens, use is made of the Q-24 spectroscope, with excitation produced by a spark generator in accordance with the Feissner scheme (C 0.012 L 0), copper interchangeable electrode, preliminary sparking for 45 sec, photography for 120 sec. The light flux incident on the slit of the spectrograph is attenuated by a gray filter and a step wedge. The analytical lines Mg 2796 -- Fe 2788 Å and Mg 2802 -- Fe 2788 Å are subjected to photometry at different steps, depending on the magnesium contents. No effect of the structure of the alloy (white or annealed cast iron) has been observed. The mean squared error of the analysis is 5--6 relative percent, the duration is ~ 20 min.
-- A.B. Shayevich

Card 2/2

CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7348

Author : Weiss Jan, Bieber Boleslav

Inst : -

Title : Determination of Small Amounts of Sodium in an Alloy of Aluminum and Silicon with the Aid of a Flame Photometer.

Orig Pub : Hutn. listy, 1959, 14, No 3, 247-248

Abstract : The principles of the method are described and the procedure for preparing the solutions. The plotting of the calibration curves was described. The question is considered of the influence of other elements on the accuracy of the determination. As a result of the experiments performed it has been established that the determination of the sodium is affected principally by the amount of aluminum. The accuracy of the determination is 0.002% sodium at a sodium contents in the specimen of several thousandths or several hundredths of a percent. -- V. Piffl

Card 1/1

CHINA/Optics

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7355

Author : Ren Ta-Kang, Han Thang-yu, Yu Po, Chang Kung-soo,
Wang Hung-chang

Inst : Institute of Metal Research, Academy Sinica, China

Title : Universal Method of Spectrochemical Analysis of
Alloyed Steels.

Orig Pub : Uli syuebao, Acta phys, sinica, 1959, 15, No 4, 173-177

Abstract : The authors describe two universal methods of spectrochemical analysis of alloys of steel, in which the preparation is simplified and the effect of microstructure and physical state of the specimens is reduced. In the "dissolution method" the steel specimens are dissolved in acid and the solution is fed in drops unto the plane face of the carbon spark electrodes. In the "powder method"

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CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7355

oxides prepared from the steel specimens are placed in a cavity inside the carbon electrodes and are excited in the arc. The methods, as shown by experiment, give satisfactory results.

Card 2/2

POLAND/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7357
Author : Biernat Zofia
Inst : -
Title : Spectrographic Determination of Traces of Elements in
Rocks.
Orig Pub : Chem. Analit., 1958, 3, No 5-6, 775
Abstract : No abstract.

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POLAND/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7360
Author : Witkowska Stanislaw
Inst : -
Title : Spectrographic Method of Quantitative Determination of
Germanium in Zinc Ores and Metallurgical Semi-Finished
Products.
Orig Pub : Chem. andlit. (Polska), 1959, 4, No -12, 471-475
Abstract : No abstract.

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POLAND/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7386

Author : Wagnerowski Tadeusz

Inst : -

Title : Measurement of Dispersion with the Aid of a Compensator

Orig Pub : Pomiar, Automat., kontrola, 1959, 5, No 2, 70-71

Abstract : Formulas are derived which make it possible to calculate the average dispersion of matter from the angular dispersion $\Delta \beta$ of the boundary of the bright and dark field in the determination of the index of refraction with a refractometer, by the method of the boundary ray. Possibility is indicated of measuring $\Delta \beta$ with the aid of a compensator, consisting of two rotating direct-view prisms. The procedure of such measurements is described. Numerical examples are given. -- I.V. Peysakhson

Card 1/1

CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7393

Author : -

Inst : -

Title : Report on the Construction of a Spectroscope for Steel Analysis

Orig Pub : Uli syuebao, Acta phys. sinica, 1959, 15, No 6, 277-281

Abstract : The authors describe a spectroscope they constructed for visual analysis of steel and other alloys. The instrument is constructed on the auto-collimation principle with two prisms, an achromatic objective, and a Kellner eyepiece 25 x. The spectrum range is 3900--7000 Å. The reciprocal linear dispersion is 0.89 Å/mm at 4358 Å and 2.91 Å/mm at 5893 Å. The resolution is 0.14 and 0.59 Å respectively. A detailed calculation of the optical system is given.

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CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7404

Author : -

Inst : Fu-Dan University, China

Title : Photoelectric Direct-Reading Apparatus for a Medium-Dispersion Quartz Spectrograph and Analysis of Copper in Aluminum Alloys.

Orig Pub : Uli syuebao, Acta phys. sinica, 1959, 15, No 6, 318-324

Abstract : An attachment is described for a spectrograph with two photomultipliers and corresponding receiving-detecting and reading devices. The measurement is by the capacitor-discharge method. To analyze copper in aluminum alloys, the photo-multiplier is set at the Al 2660 Å (standard) and Cu 2247 Å lines. The range of measurement concentration is 2.3--6.7%. Optical and electrical schemes and

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CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7404

calibration curves are given.
Bibliography, 12 titles.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7418

Author : Gross Bernhard

Inst : -

Title : Compton Effect Current

Orig Pub : Z. Phys., 1959, 155, No 4, 479-487

Abstract : It is shown theoretically and experimentally that the current arising in insulators because of the appearance of Compton electrons in the absorption of hard quanta is proportional to the radiation energy flux. Gamma radiation from Co^{60} (2270 curie) is used. An electrometer is used to measure the current (4×10^{-12} a/cm²) arising when a plexiglass block measuring 12 x 12 x 2.5 cm is irradiated. -- I.G. Shveytser

Card 1/1

EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7423

Author : Reiss Karl, H.

Inst : -

Title : Physical Limits of Possibility of Eliminating X-Ray Scattered Radiation with the Aid of Grid Diaphragms

Orig Pub : Z. angew. Phys., 1959, 11, No 5, 184-188

Abstract : The author considers theoretically the connection between the parameters of the grid diaphragm and the ratio of the transmission of the grid to primary and secondary x-rays (selectivity of the grid). The optimum parameters of the grid are found (for each region of the voltages employed), which ensure the highest selectivity. Experimental values of the latter actually do not exceed these calculated theoretically. -- I.Ya. Nikiforov

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7425

Author : Kakuschadse, T.I.

Inst : -

Title : The Satellites $K\alpha_3$ and $K\beta'$ of X-Ray Spectral Line

Orig Pub : Ann. Phys. (DDR), 1959, 3, No 7-8, 352-359

Abstract : It is proposed that in a transition metal, owing to the interaction between the external electrons and the thermal vibrations of the lattice, direct and inverse electron transitions occur between the 3d and 4s levels both within the confines of the shell of one ion, and between neighboring ions. The transitions of the former kind, $4s \rightarrow 3d$, occurring during the instant of emission of a $K\alpha_1$ photon, cause the appearance of a short-wave $K\alpha_3$ satellite, and transitions of the second kind (cross over) $3d \rightarrow 4s$, cause the appearance of the long-wave $K\beta'$ satellite. Calculation of the dependence of the density of the

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7425

electron states on the temperature has shown that the intensity of the $K\beta'$ satellite should increase with increasing specimen temperature. The asymmetry of the $K\alpha_1$ and $K\alpha_2$ lines is explained by the superposition of certain satellites on these lines. -- I.Ya. Nikiforov

Card 2/2

Abs Jour : Ref Zhur Fizka, No 3, 1960, 7439

Author : Faessler, A., Kramer, H.

Inst : The University, Munich, West Germany

Title : On the Existence of Silicon Oxides SiO_2 , SiO , and Si_2O_3

Orig Pub : Ann. Physik (DDR), 1959, 4, No 1-5, 263-268

Abstract : Using a vacuum x-ray spectrograph with a quartz crystal bent in a radius of 1 m, the doublet $\text{K}\alpha_{1,2}$ of silicon was investigated by the secondary method as a function of the degree of oxidation of the latter. Primary x-rays from platinum, excited at 20 kv and 40 ma, was used. The specimens (secondary radiators) were prepared by sputtering silicon oxides on a copper or platinum plate. To prepare a specimen of pure silicon, a single crystal of silicon was used purified by the method of zone melting

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Abs Jour : Ref Zhur Fizika, No 3, 1960, 7439

(up to 10^{-6} atomic percent of impurity). The exposure time amounted to 3 hours. The positions of the $\text{Si-K}\alpha_{1,2}$ lines was determined with respect to the $\text{Co-K}\alpha_1$ line. A shift is observed of the $\text{Si-K}\alpha_{1,2}$ doublet towards the short-wave side with increasing degree of oxidation. Its values are 0.44 ev, 0.55 ev, and 0.60 ev for Si_2O , Si_2O_3 , and SiO_2 respectively. A comparison of the spectrograms (10 x) of commercial SiO in a 1 : 1 mixture of Si with SiO_2 has shown that SiO is a mixture of Si with different oxides, and not, as previously assumed, a 1 : 1 mixture of Si and SiO_2 . -- I.Ya. Nikiforov

Card 2/2

HUNGARY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7478

Author : Gergely Gyorgy, Adam Janos

Inst : -

Title : Equal-Brightness Standards Source Light, with Lambert-Law Radiation.

Orig Pub : Magyar fiz. folyoirat, 1958, No 6, 573-576

Abstract : An equal-brightness laboratory source of light, radiating in accordance with a law close to the Lambert law, is provided by an aperture in a photometric sphere, covered with ground glass. Inside the sphere is placed an incandescent 100 watt lamp with a color temperature of 2500--2600° K. The unevenness of brightness over the surface of the ground glass does not exceed 2%, the deviation from the Lambert law in the horizontal cross section of the aperture does not exceed 11.5%, and in the vertical cross section it does not exceed 16%. Using a bolometer and a spectro-

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HUNGARY/Optics-

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7478

radiometer, the relative distribution of the spectral density of radiation of the source and its energy luminosity measured, from which the energy and visual brightnesses are calculated. Measurements are made for a series of light filters placed in front of the output opening of the sphere. The results of the measurements and calculations are given in a table.

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CHINA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7484
Author : Khu Khe-chzhun
Inst : -
Title : Hydrogen Discharge Tube as a Source of Continuous
Radiation of Ultraviolet Rays.
Orig Pub : Sibeï dasyue syuebao)tsz"zhan' kesyue), Khibei Daxue
xuebao. Ziran kexue, 1958, (1959), No 3, 27-28
Abstract : No abstract.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7488
Author : Friel Hans-Immo, Weise Horts
Inst : -
Title : Electronoptical Inverter--Photoelectric Instrument for
Producing Images of Object in Ultraviolet and Infrared
Portions of the Spectrum and to Amplify Images.
Orig Pub : Janæer Recndschau, 1959, 4, No 3, 93-97
Abstract : Popular article, containing the description of the elec-
tronoptical converters produced by the firm VEB Carl
Zeiss (Jena, East Germany) and their applications.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7509

Author : Eggert, J.

Inst : Photographic Institute, Confederation Technical College,
Zurich, Switzerland

Title : On the Spectral Sensitivity of Photographic Emulsions

Orig Pub : Ann. Phys. (DDR), 1959, 4, No 1-5, 140-144

Abstract : The long-wave ($>490 \text{ m}\mu$) "tail" of the light sensitivity of silver bromide crystals, particularly those manufactured in the presence of a binder, is due to the occurrence of additional disturbances to the lattice, playing a double role -- they have their own light-absorbing ability and they serve as places of formation of photolytic silver. Connected with these disturbances is a system of local energy levels, lying in the forbidden zone between the

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7509

conduction and valence bands. In optical sensitization, the dye and the silver bromide crystal on which it is absorbed should be considered as a single system, and the result of the absorption is also the occurrence of a system of local levels in the intermediate zone. Then the mechanism of optical sensitization can be represented as a process of transfer of an electron to the conduction band, with participation of the newly produced levels. At the same time, the principal difference between the optical and chemical sensitization disappears, since both reduce to the creation of additional levels in the intermediate band. The author confirms his ideas by a new review of his earlier papers (principally together with Kleinschrod and Biltz), in particular those pertaining to photoemulsions with direct blackening, and also to the results obtained for silver-bromide photocells (Amsler H., Z. Electrochem., 1953, 57, 1801). -- A.L. Kartuzhauskiy

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CZECHOSLOVAKIA/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7523

Author : Farsky Vojtech

Inst : -

Title : Calculating Procedure in Additive Filtration

Orig Pub : Jemna mech. a opt., 1959, 4, No 3, 74-77

Abstract : A method is described for calculating the modulation of the light flux in additive printing of film copies, based on the analogy of the latter with three-color colorimetry. The calculations are similar to ordinary calculations for color addition.

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7524

Author : Guntermann Siegfried

Inst : -

Title : On the Color Temperature and Its Equalization in Color Photographs.

Orig Pub : Bild und Ton, 1959, 12, No 6, 170-178

Abstract : A system is described of compensation for differences in color temperature of the photographic illumination from the temperature for which the photographic material is designed. Both the color temperature and the compensating optical filters are characterized by so called "Mired Units" thanks to which all the necessary calculations reduce to the addition of two numbers. Values of Mired units are given for different illumination conditions in the different times of the year, and the values of these units for several films and light filters made by the Agfa firm are given. -- D.K. Balabukha

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EAST GERMANY/Optics -

K-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 7535

Author : Grabke Otto

Inst : VEB Defa Kopierwerke, Berlin, East Germany

Title : Use of the Debie "Matipo Color" Copying Apparatus,
1956 Model, for Additive Printing on Agfa Color Film.

Orig Pub : Bild und Ton, 1959, 12, No 5, 130-133

Abstract : The principal features of the so-called additive method of
mition film printing are described, and the possibility
is indicated of using the "Matip Color" copying apparatus
for printing on positives "Agfacolor" film. Optical fil-
ters are indicated (from the Agfa catalogue) and nomograms
are given for the changeover from conditional percentages
of ordinary correction optical filters to the numbers of
the screenings, used in additive printing as exposure
modulators. -- D.K. Balabukhc

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FIN

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